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Experience With the Program of Cancer Control in Massachusetts

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MANY changes have occurred in the Massachusetts death returns in the past twenty-five years. The death rate for all causes has dropped from 1,695 per 100,000 in 1901 to 1,256 in 1926. The median age at time of death for all causes has increased from 38.8 to 57.8 years.

The rates for many of the individual diseases have shown material changes. Among these are typhoid fever, which has decreased from 19.7 to 1.4; scarlet fever which has dropped from 13.5 to 2.78; diphtheria which has declined from 34.3 to 5.9; and tuberculosis which fell from 235.0 to 83.4. During this same period, however, the circulatory diseases have increased from 163 to 309, diabetes from 11 to 19.8, and cancer from 73 to 127. Fifty years ago the chronic degenerative diseases comprised one-eighth of all deaths. Today they comprise over one-half.

While other factors than public health accomplishments have been instrumental in lowering the rate of some of the diseases, there can be no doubt that part of the decreases have been the direct result of this work. Better diagnosis will account for an additional part of the seeming increases. Regardless of the reasons for the increase in the degenerative diseases, it is apparent that these diseases are fast replacing others as causes of death, and public health measures should be instituted toward their control.

The Massachusetts Department of Public Health has started a campaign against the degenerative diseases by inaugurating a cancer program, as the cancer situation seemed more urgent than that of any of the other diseases in Massachusetts. A comprehensive study of cancer with the facilities for its control was first made. This included a review of the cancer literature, surveys in selected towns and cities, questionnaires to doctors, hospitals, and overseers of the poor, a statistical study of the cancer death records, and numerous interviews with recognized authorities on the disease.

In 1842 the cancer death rate was 13 per 100,000; in 1860 the rate was 26; in 1900 it was 71; while in 1926 it was 126.8. That this increase is not all real is obvious. In the early years many deaths which were undoubtedly due to cancer were certified as senility, stomach trouble, or unknown cause. Even at the present day, there is still confusion in diagnosis, and the rate of 126.8 is probably too low, but when allowance has been made for improvements in diagnosis and better certification, there still remains a definite increase in the cancer death rate. This increase in rate present in both sexes, is greater among males than females. In the female group there has been a tendency for the curve of cancer death rate to flatten. This was so marked in 1926 that there were 300 less deaths than might have been expected from the study of the long-time trend.

In the years 1920 to 1925, Massachusetts had the highest cancer death rate of any state in the Union, when adjustments had been made for age and sex distributions. In this same period, New York was second, Rhode Island third, and Connecticut fourth, while many of the southern states had very low rates.

The average person waits about 8 months between the first symptoms noted and the first consultation with a physician. Boston citizens wait one-half a month longer before submitting to an operation than do the residents of the state outside Boston. When we know that the chance of cure decreases as much as 16 per cent per month in one type of cancer, it is apparent that the long delay is the cause of many needless deaths. At the present time, in Massachusetts there are a sufficient number of hospital beds to care for all operative cases, but there is a need for more beds for terminal cases. With the present delay in seeking medical advice, the number of terminal beds needed in Massachusetts is about 10 per cent of the number of yearly cancer deaths. If the 8 months' delay can be appreciably reduced, the number of terminal cancer beds needed will likewise be reduced. Facilities for x-ray and radium treatment are not uniformly available throughout the Commonwealth.

Our cancer control program is divided into four parts: hospitalization, clinic, education and investigation.

The hospitalization program has two aspects: one dealing with immediate care for the patient, the other with the determination of a long-time policy for such cases. The Pondville Hospital, renovated and opened in 1927 to receive cancer cases, is meeting in part the first of these needs. Here, 90 cases can be cared for, two-thirds of them bed patients and the remainder ambulatory. The hospital is being conducted in the most approved manner. The service given is adequate and equals or excels that obtained elsewhere. A visiting committee supplemented by a special worker is endeavoring to furnish a home-like atmosphere in the institution.

Perhaps the most important part of the project, as far as quality of service is concerned, is the consultative staff from Boston. Every effort is being made to admit as many early stage cases as possible for diagnosis and treatment in order to keep down the death rate and minimize the stigma likely to become fastened to an institution largely serving incurable cases. Early stage cases can be sent from nearby clinics as they develop. Only patients not otherwise able to obtain institutional services are accepted. Should institutions already handling incurable cancer begin transferring their patients, the 90 available beds at Pondville would soon be filled without in any way meeting the need for which it was meant.

The number of cancer patients applying furnishes facts for any program of expansion as well as suggestions for a policy for other chronic diseases. The question of centralization against decentralization as applied to hospitalization can be fairly answered after a few years' experience at Pondville. Will the patient come to a central institution to die, or will he prefer to remain near home? In tuberculosis it has frequently happened that the dying patient insists on returning home. Before embarking upon a large program of central hospitalization for cancer we must know whether our experience with this disease will be the same.

How much can be done for the cases in their homes? Hospitalization for chronic cases is the most expensive form of care. It is estimated that adequate hospitalization for a cancer patient will cost at least $35 a week. In the 6 months that the Pondville Hospital has been in operation there have been 168 admissions. This number is too small to draw conclusions of any character.

With over 5,000 deaths annually from cancer in Massachusetts, and with the cancer death rate steadily on the increase, it seems absurd to await complacently the discovery of some medical cure for cancer

before undertaking measures for the control of the disease. Such an interval of waiting in tuberculosis would have been inexcusable. For the state merely to furnish a hospital or home for the individual with cancer to pass his last days in some degree of comfort is equally short-sighted. A state cancer program must be broader and include measures which attempt to reduce the number of hopeless cancer cases.

With our present knowledge, the cure of cancer is only possible when diagnosis is made at an early stage of the disease, and prompt treatment instituted. In our study of clinic cases we have found that the average cancer case comes to the doctor 7.4 months after the first symptoms, but even then, many of them delay longer before having adequate treatment.

Any program which will successfully lower the cancer death rate must attack the delay on the part of the practicing physician as well as on the part of the patient. The most rational method of attacking these obstacles is by means of the cancer clinic.

The clinic will first give an opportunity for individuals to receive diagnostic service. It will be composed of a group of physicians recognized in their community, who are all thinking in terms of cancer. Any individual regardless of his financial standing may receive an opinion from this group. Those able to pay will be referred from the clinic to private physicians, while those unable to pay will be referred elsewhere and followed up for care and treatment.

That expert advice on cancer is needed for early diagnosis can be readily appreciated when it is realized that the average physician in Massachusetts sees between 4 and 5 cases per year, and these of different types. As each type demands a different kind of skill in its diagnosis, a physician seeing fewer than 1 case a year of a given type cannot be expert. The staff of the clinic will be composed of a group, each seeing many cases of the type of cancer peculiar to his own specialty. The interest in cancer among the profession will be further increased by consultation visits supplemented by forum discussions by experts from the larger centers. Such group specialization in fractures, goiter therapy, etc., has accomplished much in improved quality of service.

The surgeon will find patients more readily accepting his advice when it is supplemented by that of the clinic group. Where clinics have been functioning it has been found that many persons who refused to take the surgeon's advice regarding early operation, after attending clinics and having the same advice given them, returned to their surgeon for treatment. The community spirit aroused by the clinics will have a tendency to keep the subject of cancer before the lay public, and

can react only favorably in getting patients under treatment at a much earlier stage than is the case at present.

The department is endeavoring to establish clinics in a number of strategic centers. Since a cancer clinic demands not a single physician, but a group of specialists including the surgeon, the general medical man, the pathologist, roentgenologist, rhinologist, urologist, gynecologist, etc., and since its needs are not limited to the four walls of the clinic room, but demand the full resources of a modern hospital, the department has decided to stimulate clinics first in those communities that have the most to offer in professional coöperation and hospital resources.

An opportunity is asked to present the program to the organized medical profession of a given city. If it seems suitable, the local medical profession passes a vote of support to the program and authorizes the appointment of a local medical cancer committee. This committee is responsible for determining where the clinic or clinics shall be held, for outlining the policies, organizing the staff, supervising the quality of service, and directing the growth. The department meets with this committee to determine how it can best assist with its resources in personnel, supplies and funds.

The medical committee also appoints a local lay cancer committee. This latter must determine such matters as education of the local public in regard to available resources and their proper utilization, and must face the unutterable, tragic, social and economic problems which will be uncovered, as well as decide the best solution of home or hospital care for the incurable, since many will not want to die in a remote institution. The department has personnel and other resources for these lay committees, but each community must be sufficiently stirred to the need of largely meeting its own problems. Too many sound programs have failed because of local indifference or antagonism.

Each clinic is required to furnish a social worker. She will be appointed by and under the direction of the local committee. She will attend all clinics; be responsible for all special records and reports; will do the follow-up work and visit patients in their homes to see that they are receiving proper treatment and care. She will coördinate the clinic with other community social and welfare agencies, both local and state. In many cases, she will diagnose the social and financial status of the patients and plan for their further treatment or hospital care.

The minimum standard training for such a worker is graduation from a recognized school of social work, including a course in medical social service, or graduation from a recognized training school for nurses plus a course in public health nursing, or two years of general

case work with a recognized social agency and a year's experience in medical social work.

The department has a medical social worker whose duty will be to coördinate the social work in the various clinics and to find means by which follow-up work may be carried on in the non-clinic communities. The policies of social service as it relates to cancer control will be further worked out by the department with the aid of our advisory committee composed of leaders in the social and nursing field. Publicity will also be needed to disseminate facts regarding the possibilities of prevention and cure of cancer in its early stages.

In some localities the clinic is a single hospital, while in others the clinic has branches in several hospitals, and meets at different times in each of them. While the staffs of the different branches vary, there is but one management and one social worker.

Cancer clinics have already been developed in 6 communities, and within a few months this number will be increased to 12 or 13. The first clinic was organized on December 17, 1926, and the sixth on June 30, 1927. Up to January 1, 1928, 1,360 individuals have attended the clinics.

In the records are many facts which may be instrumental in determining our future policies. Thirty-one per cent of the clinic attendance has been men and 69 per cent women, and 23.1 per cent were found to have cancer. Of the group having cancer 68.8 per cent were reported to be in the operable stage. The median age of the non-cancerous individuals who attended the clinics was 46 years, while that of the cancer patient was 60 years. Of those coming to the clinics 61.6 per cent came because of newspaper publicity, 20.1 per cent at the advice of a physician, and 18.3 per cent for other reasons.

The symptoms which the cancer patients presented are classified as follows:*

Swelling	36.8	Ulceration	9.0
Pain	44.8	Deformity	2.8
Loss of Weight	8.2	Malaise	4.1
Discharge	13.9	Scaly skin	1.7
Itchings	0.7	Bleeding	0.7
		Unknown and Others	7.1

* As many patients had more than one symptom, the total is more than 100 per cent.

The location of the disease was as follows:

	Per Cent		Per Cent
Buccal cavity	22.6	Male genitals	1.6
Stomach, liver group	2.5	Breast	19.1
Peritoneum, intestine, rectum group	4.8	Other organs	1.6
Skin	30.2	Unspecified	3.8
Female genitals	13.4	Not stated	0.3

Of the individuals with cancer 14 per cent had never consulted a physician; 43.3 per cent had consulted one physician before coming to the clinic; while 33.1 per cent had consulted more than one physician, and the remainder gave no information.

The department has appointed an advisory committee to determine the best methods of publicity. One member of this committee is the state chairman for Massachusetts of the American Society for the Control of Cancer. This organization is a great aid in the state's program. At present the state is distributing literature, furnishing newspapers with material, as well as maintaining a speaker's bureau. Efforts are being made to get into closer touch with the local organizations and to interest them both in the state's program and the disease itself.

In the clinic centers the local lay committees will have charge of all publicity. Many cases will be brought to the attention of the committee. It will make arrangements for individuals who either cannot or will not avail themselves of the facilities at Pondville or elsewhere. One of its functions will be to study community resources and see in what way such problems can be solved. With sufficient interest aroused, money may become available for beds and wards to be added to existing institutions, in some instances, and for special hospitals in others.

The educational campaign should stress the following facts:

1. At first in all cancerous processes, cells in some part of the body begin to multiply. At this stage, the process is purely local and if the cells are completely removed, there will be no further recurrence of the cancer; if not removed, cells may wander to other parts of the body, and by increasing in number, may form new growths there.

2. Cancer cells in various localities act differently: cancer of the skin is a slow growing cancer and not particularly malignant; cancer of the breast is a more rapidly growing cancer and more malignant; while cancer of the mouth grows very rapidly and is extremely malignant.

3. Cancer is a disease largely confined to late adult life.

4. Cancer is often preceded by long continued irritation. Measures used to prevent such irritation should be adopted. Among these may be mentioned: improved dentistry, abstinence or limited use of tobacco and alcohol, treatment of chronic mastitis, repair of lacerated cervix, more exercise and less food.

5. Any continued irritation, any lump, any abnormal discharge, any sore that does not readily heal, any wart or mole that changes in size and appearance should arouse suspicion and send the individual to his physician.

6. Pain may not be a symptom of early cancer, and people should not wait for its appearance before consulting a physician.

Hospitalization will care for the terminal cases; clinics will aid in reducing the volume of hopeless cancer; but these will not lower the incidence of the disease.

Although mortality figures and hospital records for this disease are available and have been freely studied, little is known regarding cancer

morbidity in the community at large. The physicians of Newton, Mass., are, therefore, conducting a morbidity study. The number of those who die of cancer can be ascertained, but as the individuals who had cancer and have been cured are usually reticent regarding their condition, the exact number of cures is unknown.

The visiting nurses throughout Massachusetts are completing questionnaires which give in detail information regarding the habits of the cancer patient. Similar information is obtained from a non-cancerous patient as a control. When a sufficient number of questionnaires are available, any difference which may exist between the habits of the cancer patient and the non-cancerous individual can be noted, and studies can be made to determine whether these differences are significant.

Two morbidity surveys have been made in which all householders in 2 towns were interviewed. When these figures have been completed and tabulated, information regarding other degenerative diseases beside cancer will be available.

The death records of all cancer patients are being tabulated. From them we have already learned facts concerning the prevalence of cancer, the ages at which it is most common, the life duration of those with or without treatment, the geographical distribution, the relation between cancer and population density, and the relation to nationality.

When a patient presents himself to one of the state-aided cancer clinics, a few questions are asked regarding the symptoms and what induced him to come to the clinic. It is felt that the average patient presenting himself should be questioned as little as possible owing to his emotional strain; and extensive questioning of patients might tend to decrease the attendance. The few facts obtained, however, will furnish valuable data on the social aspects of the disease and the value of the various forms of educational publicity.

To determine the effectiveness of the Massachusetts state cancer program will be a problem for the future. But because of widespread interest in the disease, community interest is relatively easy to obtain, and in any preventive program community interest is the head-stone of the corner.

Free Dental Treatment for Cuban Children

FREE dental treatment has recently been established by the Cuban Department of Public Health for public-school pupils of Habana and nearby towns, when their parents cannot afford to pay for such service. To facilitate the service for suburban children conveyances have been provided to take them to the dental offices.

The Prevalence of Rabies in the United States and the World*

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RABIES deserves to be considered one of the most important of health problems. The number of deaths is not appalling but the suffering and fear caused by it are so great that they make this the most dreaded of all diseases. The co-authors of this paper, having both served at different times as director of the Indiana Pasteur Institute and, having seen the great increase in the disease in that state, determined to find to what extent this condition prevailed in other states and in other parts of the world. Data on the subject are fragmentary, hard to get, and not at all reliable.

Questionnaires were sent to the health officer of every state in the Union, to all the provinces of Canada, and to practically all foreign countries, asking for data on rabies in man and in animals. By this and other means information was received from every state though not always was the information complete. Medical literature was exhaustively searched for references to geographical distribution of the disease and for evidences of its increase or decrease. About thirty foreign countries answered our letter—a most interesting correspondence. A voluminous letter from Japan is still untranslated.

From this large mass of evidence we have endeavored to sort out the salient facts, though we are keenly aware of the fact that much of the data is conflicting, as for example the total number of human deaths as reported to us by states, and as reported by the Bureau of the Census for the U. S. Registration Area.

In order to show present conditions in as graphic a manner as possible we have attempted to shade a map of the United States to represent the prevalence of rabies. This map was made as nearly as possible on the same scale as another published by Sellers [1] representing conditions in 1921, also presented here. Sellers's shading is made on basis

* Read before the Laboratory Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

FIGURE 1

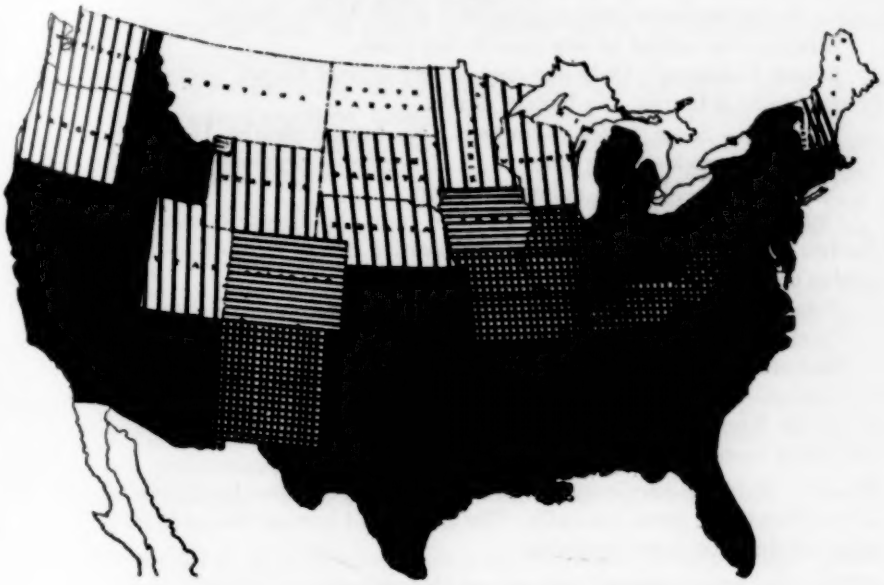
MAPS SHOWING PREVALENCE OF RABIES IN UNITED STATES IN 1921 ACCORDING TO SELLERS

of the number of cases in animals per 100,000 human population—not a very satisfactory basis but the best that could be devised under the circumstances. Frequently in the case of our investigation such a source of information was evidently unreliable, and in such event any other available source of information was used. If, for example, the number of human deaths for a given state was high that state was made black even though the number of cases in animals reported was low (incomplete returns). The state of New York was made black on basis of various references to the condition in medical literature.[2-7] Texas was made black on the strength of newspaper reports and records of companies selling rabies vaccine. Such sources are not highly satistory, but we believe that with this explanation their use is justifiable.

It is interesting to note that Kerr and Stimson [1] found little of this disease in the western states in 1908. They report that California, Idaho, Nevada, and New Mexico were free of the disease, while in 1926 these states were heavily infected. Indeed, California has had more deaths (human) in recent years than any other state of which we have record (68 deaths since 1909). California shows two peaks in her epidemic, 1912-13 with 9 and 8 human deaths respectively, and 1923 with 11.

FIGURE II

RABIES IN THE UNITED STATES IN 1926
MAP MADE ON THE SAME BASIS AS THAT OF SELLERS
AS FAR AS WAS POSSIBLE



KEY

Dotted	no data
White	no rabies
Vertical lines	less than one positive head per 100,000 human population
Horizontal lines	one to five " " " " " "
Crossed lines	five to ten " " " " " "
Solid Black	ten or more " " " " " "

The following states reported that the disease is now increasing or has done so in very recent years: Arkansas, California, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia, and the District of Columbia.

If we pin our reliance upon figures it would seem that there has been a very great increase in certain states (See 4 charts).

Considering the seriousness of this disease both in man and animals it is quite surprising that there are so few reliable records. The loss of stock and the expense of giving treatment to man and beast must cause the expense of this strictly preventable disease to mount well into the millions of dollars each year. The loss of human life is by no means inconsiderable. Apparently the most reliable records are those of human deaths reported to the Bureau of the Census.

Rabies in other countries than our own may be of some interest. The data presented is from questionnaires and from the literature.

Canada—Since the map of the United States shows very little rabies in the northern states we might expect still less in Canada. Our data bear out this expectation, though we know there is some of it in the Arctic regions.

Alberta—No record of any case in ten years.

British Columbia—Only one case in any animal known, and this was in a dog brought in by a tourist. No human deaths.

Manitoba—Some rabies in animals. No human deaths.

New Brunswick—None since 1918. No records previous to that date.

Nova Scotia—None in animals or man.

Ontario—After several years' freedom from the disease it was introduced from Quebec and quickly spread. Forty-one positive brains were examined in 1926. No human deaths.

Prince Edward Island—Questionnaire not answered.

Quebec—Rabies spreading rapidly from two foci. No human deaths.

Saskatchewan—No rabies 1926.

Alaska—Not common but has been observed particularly in wolves and foxes.

Arctic Regions—Nansen mentions the occurrence of rabies in "Farthest North," and it has been reported from Greenland.

Mexico—Rabies is very common. There are many Pasteur Institutes and thousands of treatments are given annually. The number of human deaths is rather large but exact information is not available.

Cuba—Has been epidemic to a serious degree in recent years.

South America

Ecuador—Not common.

Venezuela—Rare in animals and extremely so in human beings.

Argentina—Fairly prevalent.

Brazil—It has been epidemic at different times especially in the north.

El Salvadore—Present.

From incomplete returns we may reasonably conclude that the disease is present in moderate amount in the greater portion of the continent.

Europe

Belgium—There has been very little rabies except during the Great War when antirabic precautions were relaxed. During times of peace elaborate precautions are taken to prevent its introduction. These methods have been highly effective.

England—By strict muzzling ordinances, England was able entirely to rid the country of the disease in 1902. After that time there was none until 1918 when the disease was re-introduced. It spread rapidly but has again come under control and there has been none since 1922.

France—The home land of Pasteur has long been seriously plagued with rabies. In 1913 it was almost eradicated but flared up again during and after the Great War to alarming proportions. It is at present declining.

Germany—The rabies situation was well in hand before the war, there being on the average 300 to 400 cases in animals annually. In 1915, it rose to 1018, after which there was an irregular increase to 2699 in 1924. Since that date the condition has improved and is greatly reduced in 1927. Human deaths were as

follows: 1924, 48; 1925, 20; 1926, 22. Persons bitten by rabid dogs for the same years were 2417, 1159, and 579 respectively.

Holland—Because of very rigid control measures there were no cases of rabies in Holland previous to the Great War. During that crisis there was some in the borders of the country but again none since.

Ireland—There has been no rabies for twenty years. All immigrant dogs are quarantined for six months.

Russia—No communication was received from this country, but it is well known that the rabies situation there is very serious, perhaps the worst of any country in the world. The disorganized state of the government, the prevailing ignorance, and the vast territory involved makes the situation well nigh hopeless.

Sweden—There has been no rabies since 1886 when there was one case in an imported animal. Strict regulations govern the importation of all members of the dog family.

Switzerland—Rabies is rare. Three hundred and twenty-nine Pasteur treatments were given in the quarter of a century just closed, and there was one human death.

Austria—Has been epidemic in recent years.

Italy—No very recent data, but has been quite common for a long time.

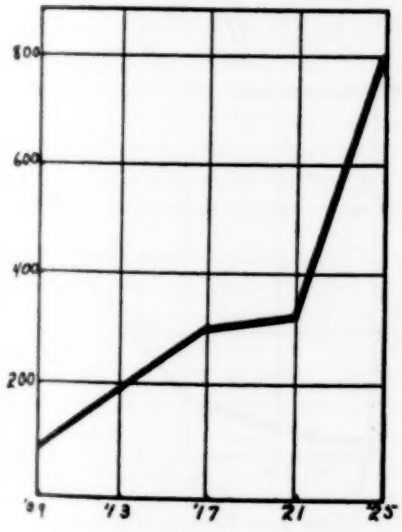
Balkan States—It has been an important problem here since the Great War and the years immediately preceding.

Spain and Portugal—Rabies very important public health problem.

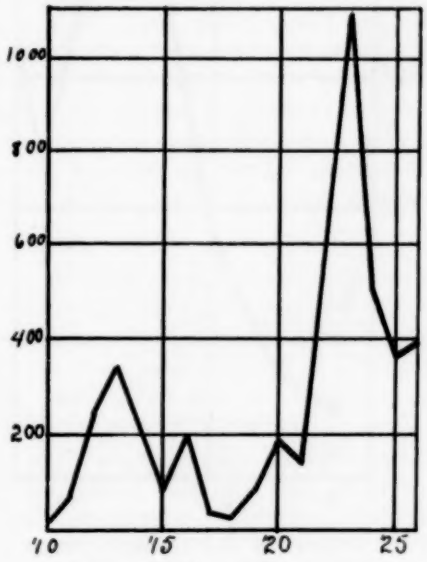
Africa

Egypt—Rabies is very common among the countless homeless dogs. There is little effective control of the situation. The number of cases treated trebled from 1914 to 1924, but has decreased since. One thousand two hundred and fifty-one treatments were given in 1926 at Cairo alone.

Union of South Africa—fairly common in animals, and occasional cases in human beings.



NUMBER OF POSITIVE HEADS FOUND
NORTH CAROLINA



NUMBER OF POSITIVE HEADS FOUND
CALIFORNIA

Occidental French Africa—Rabies present but not prevalent.

Western Africa—Rabies is common.

Asia

Palestine—Rabies is very common.

Arabia—Common in the settled portions.

India—Data from the Pasteur Institute at Calcutta for the province of Bengal (population, 40,000,000): 1924 (7 months) 1995 patients treated, of whom 17 died; 1925, 5585 cases treated of whom 33 died. Total deaths for Bengal (human) 304 in 1925.

Japan—A very serious public health problem.

China—Rabies was known in the time of Confucius and has been a serious problem continuously to this day.

Siam—Very common.

Siberia—Very prevalent.

Tibet—Prevalent.

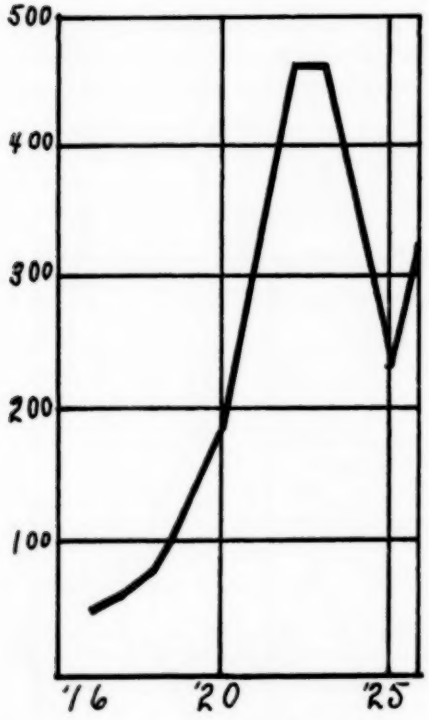
Oceanic Islands

Australia—Free of rabies and has always been so.

Hawaii—Free of rabies. All animals from foreign ports are quarantined for 128 days.

Philippines—Rabies is very common among the many dogs. Human deaths were 103 in 1925; 93 in 1926.

Dutch East Indies—Fairly common.

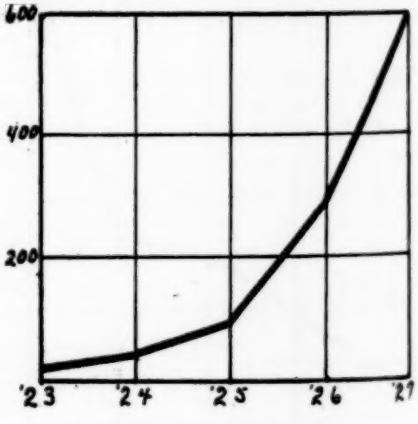


NUMBER OF POSITIVE HEADS FOUND
MASSACHUSETTS

SUMMARY

1. Rabies is on the increase in the United States, or at least was so two years ago.

2. It increased in Europe during the Great War but has declined somewhat during the last three to five years there.



NUMBER OF POSITIVE HEADS FOUND
INDIANA

3. It has been completely eradicated from certain countries, while in others it has apparently never existed.

4. In the main, rabies is more prevalent in those parts of the world where civilization is retarded, and poverty prevails.

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DISCUSSION

Dr. Strauss, Virginia—I can only second what Dr. Rice has said as to the extreme difficulty in getting reliable figures on the subject. A few years ago we checked up on the human deaths, and found that the only figures upon which we could place any dependence were numbers of positive dogs heads reported. We get that information not only from our own laboratories, but from the Washington laboratories who report all positive heads that they get from the northern part of Virginia. In that way, we are able to follow fairly well the progress of the disease through the state.

A few years ago, there was a very obvious increase along the entire southern border, which increase appeared to move gradually up through the state. By the time it reached the central section, it began to drop off, and this year we have a very decided decrease in the amount of rabies. Concerning our positive heads, for a fixed 8 months for 1925, 1926 and 1927, we find that in 1926 we had an increase of 57 per cent over 1925, while in 1927 we have a 30 per cent decrease under 1926. I believe the disease is really decreasing, temporarily at least, with us in Virginia.

I had the opportunity to watch a very definite epidemic in Richmond a year ago last spring. We had gone for a 2-year period in Richmond with no rabies at all, then in the suburbs there appeared one or two cases, which spread with great rapidity until it covered the entire city. There were three or four hundred dogs with the infection—fortunately no human cases. There was issued an ordinance at that time, compelling muzzling or confining of all dogs, and it seemed as though the dogs could read the ordinance, because there was an immediate decrease in the disease. What we think helped largely was the fact that the city put on extra dog-catchers, and almost completely rid the city of stray dogs. The stray dog is, of course, the real menace.

Dr. Howell, Springfield, Ill.—In 1923 in Illinois our rabies troubles began just as they did in Indiana. The first year, the trouble was confined to the southern part of the state, coming across the Wabash River. Gradually it spread northward. It has now reached the northern part of the state, and the city of Chicago is getting each month as many positive dog heads as it had for an entire year formerly. In the southern part of the state, the disease is falling off.

By plotting the cases geographically, and comparing your monthly returns with the normal rates, you can pretty nearly predict how long your epidemic is going to last. We have just passed through the time of year—August and September—when rabies should be at its lowest. However, Chicago has had a rather sharp increase during those months, indicating that next spring, perhaps, there will be a

very marked increase in the disease there. It would seem that they cannot expect a decrease until a year after next, unless stringent measures are taken. The southern part of the state will rapidly clear itself of the disease, I believe.

The matter of the stray dog interested me, and therefore, with every positive head we have, we send out a little slip to find out how many other dogs had been bitten, etc. Just before I came to Cincinnati, I tabulated my results and received 75 answers. Thirty-five of the dogs that had been examined in 4 different laboratories in Illinois were strays, and the owners of the remaining 40 were known. The 75 dogs had bitten 58 persons, 136 other dogs and 14 other animals, such as horses and cattle. The stray dogs may have bitten more dogs than those of which we have a record, but it is pretty easy to check up the number of people bitten, because we hear of those. It would seem that the stray dog is of great importance in disseminating the disease among other dogs, and not as much of a menace to people.

Dr. Shore—Rabies has always had a very unique interest in that it so completely differs from all other known diseases. We know more about it than we do about any other disease, and the feature which I want to emphasize here is that we know exactly how to exterminate it. We do not know that about any other disease, unless possibly it is yellow fever, and it is not very much of a compliment that we have such a large amount, and that only such countries as Russia and India exceed us greatly in numbers.

The International Conference on Rabies which was held in April discussed this disease from several angles. The resolutions adopted at that conference have been put into print. I think, among those resolutions, the most important was the last paragraph which read something like this: That the Conference believed and was agreed that rabies could be exterminated only by the restriction of the liberty of the dog unless muzzled or confined to the premises of the owner, and the extermination of the ownerless dog and it moved that the resolution be embodied in all the countries in the world. This has already been done in Great Britain and in the Scandinavian countries. That is the only way that we are going to get rid of the disease here. We know it is absolutely impossible to get every dog vaccinated and to vaccinate them every year. It is also going to be very difficult to pass and enforce adequate dog laws in this country, but it is less difficult than to attempt universal vaccination.

One other point in relation to the treatment paralysis, which is very distressing when it occurs—I think it is very important that when this accident does occur, and when it is so unfortunate that it results in death, that an autopsy be secured, if possible, in order to determine if we can the real nature of this treatment paralysis. A boy developed paralysis on the 16th day of treatment. He had been very badly bitten in the face, but treatment was advised, and I saw him on the 5th day of the disease. He died, and an examination of his brain showed that he had meningitis. It was impossible to diagnose the disease during life, and this diagnosis was further complicated as a spinal puncture had been made.

The Administrative Control of Communicable Diseases*

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THIS is a broad subject. Three official agencies, federal, state and local, are concerned in the administrative control of communicable disease. Although their services overlap, this discussion will be confined more especially to communicable disease control as administered by the small municipal or county health department.

Although we speak of the control of communicable disease, what we really mean is the attempt to control human beings (or animals) already suffering from disease or conditions which if not controlled may lead to their infection.

As our knowledge has increased in regard to the natural history of certain communicable diseases, our methods of control have improved. Because of their varying character, no two communicable diseases can be dealt with by identical methods of administrative control.

Despite this fact, certain general principles can be laid down as essential in any fairly comprehensive attempt toward sound administrative procedure. These of necessity may vary somewhat in detail, depending on particular circumstances.

The health officer of the local unit must have from the medical profession or other sources, prompt notification of the presence of communicable disease, and he in turn should furnish to the profession, directly or indirectly, clinical and laboratory diagnostic aids in order that early diagnosis may be made of suspicious cases. When a case is reported, the executive officer or one of his staff should visit promptly:

1. To isolate the patient either at home or in hospital
2. To quarantine or supervise, as the situation indicates, both immediate and remote contacts
3. To placard the premises and instruct the householder
4. To make such investigations as to the source and mode of infection as the circumstances may warrant, not only that the source of infection may be discovered but that further spread of infection may be stopped
5. To collect the essential epidemiologic data and file them as a permanent record

* Read before the Health Officers Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 18, 1927.

In addition, the live health officer will maintain close coöperation not only with the medical profession, but with the school authorities and all unofficial agencies.

If the local health officer functioned as outlined above and reported the case to the central authority, with comment if indicated, his local unit would inevitably receive a relatively high rating from the point of view of efficiency. But such a local unit is extraordinary. The unit that I have peculiarly in mind is ordinary. It has done two things when the case was reported, placarded the premises and mailed a report of the case to the central authority. It will, no doubt, "fumigate" when "the card comes down," a form of worship in terms of burning incense to the false gods of gaseous fumigation still in vogue. You have no doubt heard it said of some kindly, garrulous, old gentleman, who was in his anecdotage, that he was simply "living in the past." It seems that there are a good many small health departments still living in the past.

It is true that fifty years ago "a warning sign" plus fumigation when the case was released from quarantine gave satisfactory evidence, by means of sight and smell, to the interested public that the board of health was functioning perfectly. It is true that antagonism toward boards of health was engendered by the rigidity of quarantine and the show of authority which was part and parcel of our old control procedures. But fifty years ago little or nothing was known about infectious diseases. Although what we still have to learn at times fills us with dismay, the advance in our knowledge of these diseases has been remarkable. We have adapted our administrative procedures somewhat to this newer knowledge. We use coercion less and coöperation more. We depend on medical supervision in the control of contacts and give considerable latitude to proven immunes. Finally, with artificial immunization we are on the way toward the soundest possible method of communicable disease control.

While we must still consider certain factors of control concerned with the environment, especially water supply, sewage disposal, and the supervision of milk and other foods, we are now concerned more with the individual than with his environment. For some years most of us have believed that "sanitary instruction is even more important than sanitary legislation."

The larger and better organized health departments have quietly met the demand for individual instruction in connection with communicable disease control by means of the public health nurse. How have the small local departments met the challenge? A few have, with courage and good judgment, appointed nurses as executives and a few more have met the situation by combining the activities of a school

nurse with those of a communicable disease nurse. The argument against the use of a communicable disease nurse in a small place, except for its greater intensity, is similar to arguments which have been advanced in larger areas, namely, that she may be a carrier of infection. This question was fully discussed in the April, 1926, number of the JOURNAL of this Association.[1] There may still be argument against the utilization of a nursing service in connection with communicable disease control, but it seems to me that those who will continue this argument, will also continue to argue in favor of gaseous fumigation.

The nurse undoubtedly has a definite place in the adminstrative control of communicable disease. Is there an informed opinion among the householders of your small localities and mine about the actual means of spread of the common communicable diseases of childhood? The need for individual instruction in the few sound methods of communicable disease control is a crying one indeed. As I see it, we need more sense and less nonsense in connection with our efforts to control infection both within and without the household. How many mothers in small places understand the purpose of isolation and quarantine? Do families in your small towns never have secondary cases following a case of typhoid fever in the household? Do the mothers in all your smaller communities know that measles and whooping cough are especially fatal diseases in children under 3 years? Is concurrent disinfection actually carried out in connection with isolation of communicable disease in such places? Finally, are the mothers in this type of locality fully comprehending the value of artificial immunization? The answer to all these questions for the majority of our smaller communities is "No."

The gap between what we know and what we want our citizens to know is tremendous. What an opportunity to "put over" all this individual instruction by means of the public health nurse. At no other time is the mother so responsive to instruction as when one of her family lies ill of some communicable disease. With instructive home visits, it would soon become common knowledge that with a few exceptions communicable diseases are spread by the route that infected body discharges take from the patient or carrier to the susceptible individual. Perhaps a slogan might be developed for such a nursing service which might run like this, "Preaching as she placards," teaching that "people, not things, spread disease."

One constantly hears of the lack of funds in any health department, but the small municipality or county is especially hampered in any attempt to develop even a minimum of health service. A communicable disease nursing service, however, may be developed either as a full-

time, or part-time service in combination with school, tuberculosis, or other community nursing service. With such an arrangement there is possible a maximum of service at minimum expense. Upon this service and its development rests the ultimate success of communicable disease control in the smaller places.

I am by no means concerned with the "glorification" of the public health nurse. Yet the nurse has demonstrated her effectiveness in other phases of public health activity. However important proper training may be, the successful nurse in addition usually has the reputation of accomplishment, plus the peculiar power of making friends not only for herself but for the organization for which she stands. This is of more than passing importance. Health departments as they go have no host of friends among the householders. Too many health departments have forgotten that the householder has a soul and a mind, as well as a body. Fortunately the nurse has the happy faculty of ministering to the souls and minds of the people as well as to their bodies.

Unless the health officer or the board of health is able to reach the individual with information and instruction upon which the citizen may build for himself a course of hygienic conduct in order to escape infection, there must of necessity be futility in our administrative practices in communicable disease control.

CONCLUSIONS

Small municipal or county health departments organized with sound administrative procedures in mind do function efficiently in the control of communicable disease. These, however, are in the minority. The great majority fail to function at all, usually because of the lack of training of the executive officer, his lack of interest and vision, or both.

The use of a public health nurse either as an executive officer, or in the capacity of a communicable disease nurse, full or part time, will furnish a maximum of service at a minimum of expense.

Unless there is informed public opinion in regard to the purpose of our procedures in communicable disease control, superstition and ignorance will be constantly in conflict with scientific enlightenment.

The nurse is peculiarly fitted to carry into the homes the story of how to avoid infection and to interpret to the householder the purpose of isolation, concurrent disinfection, quarantine, and artificial immunization.

REFERENCE

1. Is the Public Health Nurse a Carrier of Infection? Abstract of Forum Session Discussion, St. Louis Annual Meeting, A. P. H. A. *A. J. P. H.*, 16, 4:346 (Apr.), 1926.

Pneumonia Quarantine*

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THE CONTROL of the morbidity and mortality of pneumonia is a major public health problem. Pneumonia ranks first in the list of acute, communicable diseases as a cause of death.

DEATHS IN 1924

Smallpox	900	Measles	8370
Infantile Paralysis	1128	Whooping Cough	8385
Scarlet Fever	3109	Diphtheria	9756
Typhoid Fever	7212	Pneumonia	108700

Prior to 1924, no concerted effort had been made in preventive medicine to control pneumonia, though the contagiousness of pneumonia seems to have been recognized as early as 1497 by Savonarola of Venice. Dunns in 1592 wrote that peri-pneumonia is a contagious disease, because he observed that it attacked many in the same family. Vaughan [1] states: "All students of epidemiology recognize that the pneumonias are infectious diseases and are disseminated by spitting, sneezing and coughing." Rosenau [2] states: "Lobar pneumonia is a communicable disease which should be classified with the infectious fevers."

In the year 1923 and early in 1924, many consecutive cases of pneumonia in a household were reported to and investigated by the Pittsburgh Department of Public Health; and during March, 1924, 22 such cases were found in which a direct, intimate contact with a primary case and second or subsequent cases of pneumonia were found by investigators of the health department to be authenticated.

Riesman,[3] in discussing pneumonia quarantine, says:

In the past, we have attacked pneumonia from the standpoint of the individual, just as we have attacked—and with about as much success—the common cold. We have looked for medicinal specifics, for prophylactic vaccines, for therapeutic

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* Read before the Health Officers Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

NOTE: Owing to the death of Dr. C. J. Vaux, Director, Department of Public Health of the City of Pittsburgh, in April, the presentation of a paper on Pneumonia Quarantine was submitted to me at that time as I had been in his council and worked with him on this subject since its inception in Pittsburgh, and, in presenting this paper I cannot do any greater honor to him than to use his language in many places and beg your indulgence if I do so.

serums, and yet, though all these efforts are deserving of praise, pneumonia is almost as devastating a disease as it was before they were begun. Let us see whether the position that pneumonia should be a quarantinable disease is well taken.

We can get a clearer answer to this question if we consider the reasons in the past that have deterred physicians from considering the disease one that can be influenced by quarantine.

Pneumonia seems in many instances to begin explosively (after a wetting or chilling), suggesting that it is an autogenous and not a heterogenous infection. When, however, we study carefully the history of pneumonia patients, we find that many had a slight, preliminary, neglected cold. This was found to be true by the Philadelphia Pneumonia Commission, and is my personal experience in private and hospital practice. Therefore the hypothesis that the abrupt onset militates against infection from another source is very much open to question.

The second reason that made men doubt the transmissibility of pneumonia is the rarity of contact infection. That point too has lost much of its force. In the first place, contact infection occurs though it may not be frequent. The other day, I was informed of a pathetic instance in one of the seashore towns of New Jersey. A physician fell ill with pneumonia. His son, a student in a New England college, was called home. The father died, and within a few days the son also died of pneumonia. Every practicing physician can recall in his own experience double or triple cases in the same household. Dr. James M. Anders, in his study of pneumonia in Philadelphia, found the highest death rate in the most densely populated parts. Dr. Frederick T. Lord has collected a number of other examples of indubitable contact infection.

We may also answer the objection with regard to contact infection by an analogy. Tuberculosis was looked on until our own time as an hereditary but not a contagious disease. Only after Dr. Flick had published his epoch-making researches on tuberculous houses did the contagiousness of the disease and the fact that tuberculosis in a given individual invariably harks back to some other tuberculous individual, gain general acceptance. And yet, actual contact infection in sanatoriums or hospitals is not common; otherwise, the contagion theory would not have had to fight its way.

The third reason that has delayed the institution of quarantine in pneumonia is the prevailing belief that the pneumococcus is a more or less constant inhabitant of the human mouth. If this were the case, then quarantine could serve no useful purpose. But is it the case? I think bacteriologists are now generally agreed that the pneumococcus found in healthy persons is nearly always a nonvirulent microorganism or one possessing but slight virulence. The highly virulent types, those responsible for the majority of the cases of pneumonia, are found only in the pneumonic patient or in the occasional carrier, an individual who has either recently recovered from pneumonia or has been in close contact with a pneumonia patient. That is the view of such distinguished authorities as Park and Williams [4] and of Bigger [5] and of Dublin. The latter expresses the unequivocal opinion that pneumonia is transmitted usually from a definite case of pneumonia or sometimes from a healthy carrier previously in contact with a pneumonia patient.

One other point of importance should be mentioned, since it has a bearing on the obscure problems of pneumonia transmission. The pneumococcus is a fairly tenacious organism. In sputum attached to clothes and not exposed to direct sunlight, it may retain its virulence as long as 55 days. Direct contact is therefore not

essential, since transmission can be brought about by surviving germs whose presence and source may not be suspected.

Perhaps there is also conveyance through non-human sources, through animals, milk, etc. While little is known about this, it is a point deserving investigation. It should furthermore be remembered that the pneumococcus is responsible for many cases of simple bronchitis, and might gain in virulence in its passage through the bronchitic patient.

When we consider the facts I have mentioned, we cannot help giving our adhesion to the proposal for a modified quarantine in pneumonia. It is a logical procedure, based on those epidemiologic grounds that have guided us toward quarantine in other infectious diseases.

Pneumonia quarantine was inaugurated in Pittsburgh on April 1, 1924, because some method was necessary to cut down the unenviable record we had of being the highest in pneumonia deaths as reported by the Department of Commerce, Washington, D. C., in a report dated January 12, 1924, embracing 72 cities, and giving Pittsburgh a rate of 371 per 100,000. We appreciated all the technical, statistical questions involved in comparative figures, and also had been watching the steady rise of pneumonia in the last ten years. In a preventive way, nothing had been done to reduce this incidence.

Based on the assumption that pneumonia is an infectious disease, a plan to have all pneumonias reportable and to place a quarantine on every case was inaugurated on April 1, 1924, appreciating that no more can be expected from quarantine of pneumonia than from quarantine of any other infection, and that the real value would be in preventing many persons from contracting the disease who otherwise would have been exposed.

The plan of quarantine and isolation was endorsed by the County Medical Societies of Allegheny County.

In Pittsburgh, the regulation covering reports of cases of pneumonia was made all inclusive in order to avoid any loophole for failure to report a case. The regulation follows:

Pneumonias (all forms) are reportable diseases in the City of Pittsburgh; specify (a) lobar pneumonia; (b) broncho pneumonia; (c) pneumonia complicating influenza; (d) pneumonia complicating other communicable diseases; (e) all other pneumonias, as traumatic, anaesthetic, senile, etc.; specify whether lobar pneumonia or broncho pneumonia in all of the above primary conditions.

Actual quarantine in certain types of cases is optional with the Department of Public Health; also, the quarantine regulation is a modified quarantine, as follows:

Modified quarantine will be enforced in all cases of pneumonia, except that under the classification "e" ("all other pneumonias, as traumatic, anaesthetic, senile, etc.") which may be quarantined, at the option of the Department of Public Health. This modified quarantine will consist of placarding, isolation of the patient,

prohibition of all visitors, but no restrictions on other members of the household, including school children, provided isolation is complete and instructions from the Department of Public Health are properly carried out. No minimum number of quarantine days specified, the quarantine period being until recovery or death of patient.

Complete sanitary cleaning of the premises is required before release, but, when this is accomplished thoroughly following the physician's report of recovery, quarantine release is made at once. In a fatal case, after sanitary cleaning, no funeral restrictions are made. Regulations governing pneumococcus carriers or laboratory release regulations were not incorporated. This may be a desirable later step, but at present, because of the apparently beneficial effect in reducing the number of cases and deaths from pneumonia and the complete approval accorded the regulation by the physicians, hospitals and citizens of Pittsburgh, the present pneumonia quarantine regulations have been satisfactory and will continue indefinitely.

When this plan went into effect, in every case reported from a private home, a Department of Public Health nurse made an investigation of the patient: age, sex, color, nativity, occupation, living conditions, contacts in house, and a history as to precedent exposure to a case of pneumonia, bronchitis, influenza and cold, and whether or not the present pneumonia was subsequent (in five days) to a prior cold or illness of the patient.

In 5277 cases so investigated, it was found that 3808 or 72 per cent gave a history of preceding "cold" or grippe, so-called. No causes were included where the attending physician made a diagnosis of influenza as the primary disease.

The reaction of the public laity and the medical fraternity to this pneumonia regulation has been a pleasing factor. At no time did we have anything but the wholehearted, earnest support of both to this work. This first step—reporting and quarantine—is a valuable aid in pneumonia prevention and has stimulated the second step in prevention—that of arousing public interest by making the public cognizant of the danger of pneumonia and reasons for regulations and results obtained. There has been no single complaint regarding pneumonia quarantine regulations by lay citizens or physicians; on the contrary, many commendatory letters have been received from hospitals, physicians, lay public and civic organizations, all indicating endorsement of the plan and willingness to coöperate.

In the summary appended, showing cases and deaths since 1923 by months, it will be noted that prior to the establishment of our reporting and quarantine regulations the number of pneumonia deaths was in

excess of the number of pneumonias reported, and that since April 1, 1924, the contrary is true. The pnenmonia incidence shows a decided drop and is so reflected by the deaths, taken year by year or by months of each year; and, while it is too early to pass conclusions definitely, from all indications, pneumonia quarantine has had some material effect in reducing the incidence in Pittsburgh.

There are many infectious, environmental, personal and climatic factors regarding the epidemiology of pneumonia which are worthy of intensive investigation and study. There is the purely medical question, with laboratory investigation, typing of cases and contacts, and the finding of the relationship of "common cold," grippe, fatigue, etc., to pneumonia.

The other aspect is of an engineering or industrial type, and has to do with heating, ventilation, living quarters, transportation, working conditions, climatic factors, fog, smoke and air pollution. The fact that the percentage of pneumonia deaths in cities is about 50 per cent greater than in rural districts may be due to greater contact or to some of the above factors.

CASES AND DEATHS—PNEUMONIAS (ALL FORMS)
PITTSBURGH, PA.

		1924	1925	1926	1927
January	Cases	112	520	298	443
	Deaths	204	210	122	157
February	Cases	92	526	311	326
	Deaths	238	195	114	113
March	Cases	194	646	676	474
	Deaths	405	260	214	172
April	Cases	559	496	480	326
	Deaths	219	177	166	109
May	Cases	311	281	181	261
	Deaths	142	104	97	115
June	Cases	203	179	145	157
	Deaths	85	78	64	71
July	Cases	111	85	97	
	Deaths	63	41	42	
August	Cases	108	112	58	
	Deaths	47	62	31	
September	Cases	153	126	76	
	Deaths	68	55	37	
October	Cases	276	212	124	
	Deaths	111	80	55	
November	Cases	371	329	181	
	Deaths	139	126	62	
December	Cases	370	297	233	
	Deaths	136	123	100	
Total	Cases	2860	3809	2860	1987
	Deaths	2074	1688	1255	737

Having the first two steps—reporting and quarantine, and rousing public interest—the third step should be organized study in centers of population as to all the factors in causation and control of pneumonia by a pneumonia commission with funds sufficient for a study over years and collaboration with similar commissions in other centers. Such a commission has been advocated in Pittsburgh, and we are in hopes that it soon will materialize and carry out the project so ably and fearlessly inaugurated by the pioneer in pneumonia quarantine, Dr. C. J. Vaux.

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Infant Mortality and Infant Welfare in Prussia

ACCORDING to an official report, the birth rate in Prussia in 1926 was 19.6 per 1,000 population, whereas in 1925 it was 20.9. The infant mortality rate in 1926 was 101 per 1,000 live births, whereas in 1925 it was 104. Infant mortality, which has been decreasing for some time, reached in 1926 the lowest level ever observed. This decrease is attributed not only to the decrease in the birth rate, but mainly to the more extensive welfare work and education of the people in infant hygiene.

Breast feeding, which has become quite prevalent since the war, is being encouraged by payment of nursing benefits by the government.

Infant health was reported to be good in most provinces. Of the approximately 15,000 infants examined in 1926 at health centers in a number of cities, 14.1 per cent were found underfed; in 1925 the percentage was 15.6, and in 1924 it was 25.

A further decrease in the number of cases of rickets was noted and severe forms were rare. Among the infants examined in 58 cities and rural districts in Prussia, 10 per cent were found to have rickets in 1926; 20 per cent in 1925, and 23 per cent in 1924.

The shortage of clothing was found to be less prevalent than in the previous year.

The number of infant health centers rose from 2,847 in 1925 to 3,115 in 1926. Infant welfare work by the municipalities and private agencies included distribution of literature on infant care and of milk, cod liver oil and similar articles. In addition, babies' outfits were loaned to needy mothers, and premiums were given for regular attendance at health centers.—Volkswohlfahrt, Berlin, Feb. 1, 1928, vol. 148.

Resistance to Pneumococcus Infection as Influenced by Breathing of Gas Combustion Products*

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IN the symposium on acute respiratory diseases held at the Cleveland meeting of the American Public Health Association, October 17, 1922, Vaughan and Palmer [1] divided the pneumonias into three types, viz., *epidemic, sequel* or secondary, and endemic or *seasonal*. They also showed that the seasonal form has a distinct cycle with, for instance, 43 per cent occurring in the first three months of the year, 24 in the second three months, 10 in the third three months, and 23 in the last three months; also that this ratio is maintained, with slight modification only, year after year. These authors likewise presented statistics to show that the behavior of pneumonia is peculiar in that cities suffer fully a third more than country districts, but that there is a vast difference in cities—a city like Pittsburgh having a ratio of 275 as against 140 for Cleveland, while 16 per cent of the deaths in Pittsburgh were attributed to pneumonia as against only 8 per cent in San Francisco. In the 25-year period from 1864 to 1888 the combined rates for several large cities in the country showed a mortality of 189, or 7 per cent of total deaths, but in the next 25 years this rate was 232, or 12 per cent of total deaths in these cities. It will be seen from the above that there is good statistical evidence pointing to atmospheric pollution by combustion products as a possible explanation for increased pneumonia death rates under certain conditions.

In 1922 Oppenheimer and Spaeth [2] reported the practical success of a method for determining susceptibility to one of the forms of pneumonia by the injection of a culture of Type I pneumococcus obtained from the diagnostic laboratory of the New York State Board of Health, which could be so controlled that the minimum lethal dose could be determined. Their method was to make intraperitoneal injections of salt solution suspensions of the culture. By the use of this method they

* Read before the Industrial Hygiene Section of the American Public Health Association, at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

announced that fatigued white and hooded rats were less susceptible to pneumococcus infection than non-fatigued rats.

Later in the same year Spaeth [2] reported similar findings for guinea pigs. Incidentally, Spaeth also found that pneumococcus grew as well in the blood from fatigued animals as in the blood of control animals, showing that the protective factor apparently produced by fatigue was not in the blood itself. Later in the same year Nicholls and Spaeth [4] reported other experiments with like conclusions, "that fatigue definitely increases the resistance of these animals (guinea pigs) to lethal injection of Type I pneumococcus."

In 1925, the year in which Spaeth [5] lost his life while collecting material in the Siamese jungle, where he contracted an infection, he further reported as a result of the same method of investigation that good physical condition appears not to include the resistance to infection and that young starved guinea pigs and exhausted pigs resist infection better than do normally fed control pigs because of the weight recovery process or increased anabolic rate, and that the factor concerned was not fatigue nor fatigue products but "that natural resistance is a function of anabolic rate."

It has been our purpose to apply the method of Spaeth and coworkers to determine the resistance to pneumonia in the matter of breathing combustion products, as from chimneys, poorly ventilated furnaces, unflued gas stoves within the home, etc.

To our knowledge no experimental evidence has yet been offered showing a disturbance in natural resistance to pneumonia under these circumstances. While, as stated above, vital statistics plainly point to such a relationship, direct evidence is apparently lacking. Our investigation has, therefore, been an attempt to supply some direct evidence. In truth, it is barely possible that such exposures may increase the resistance to pneumococcic infection by increasing the anabolic rate, such as Spaeth found in connection with fatigue and with starvation. Our investigations have been open to either finding.

ARRANGEMENTS

On March 29, 1926, we were awarded Grant 87, $500.00, by the Committee on Scientific Research of the American Medical Association "to determine by the experimental method, using lower animals, the effect of breathing combustion products of ordinary carbonaceous fuels (e.g., coal, oil, gas) upon the susceptibility to pneumonia, using a known dosage of a known type of pneumococcus for inoculation into exposed and controlled animals."

The research was undertaken with the coöperation of the Depart-

ment of Bacteriology (in charge of Dr. George B. Morrey), the Department of Metallurgy (in charge of Prof. Dana J. Demorest), and the Department of Public Health (in charge of the writer)—all departments of the Ohio State University; and after July 1, 1927, with the added assistance of the Division of Laboratories of the Ohio State Department of Health.*

The investigation got under way June 17, 1926, and continued to October 28, 1927, with equipment set up first in a ground floor laboratory of Lord Hall, and after July 1, 1927, because of building alterations, removed to the State Laboratories, also on the Campus.

METHODS, SCOPE AND COMMENTS

Small batches of white rats—4 to 19 in number in various runs—were housed in a tight box, partly glassed and having openings for inlet and outlet ventilation which could be controlled. The rats lived day and night in an atmosphere surcharged with the completely oxidized combustion products emitted from a large gas burner of the Bunsen type, which stood on the laboratory floor. Natural gas, containing no carbon monoxide, was used. An average composition of this gas analyzes as follows (Burrell)*:

Gas	*Per Cent*
Carbon dioxide (CO_2)	Trace
Methane (CH_4)	84.7
Ethane (C_2H_6)	9.4
Propane (C_3H_8)	3.0
Butane, etc. (C_4H_{10})	1.3
Nitrogen (N_2)	1.6

The products of this burner, mixed with controlled proportions of air, were collected in a superimposed funnel connected to a 3 inch iron pipe. This pipe which was several feet in length was cooled by a stream of tap water constantly running over it. This pipe entered a subcompartment of the exposure box, whence the gases passed up through small openings in the floor of the exposure box. A continuously recording thermometer and a hydrometer were placed in the box where their readings were visible from the outside; also a room thermometer, on the box. Control animals were simply kept in the usual wire cages in the same laboratory. Temperatures in the exposure box were kept as comparable to the general room temperature (ranging from 53° to 88° F.) as possible. Control animals were not confined in a closed box which would not have paralled the exposure box in which the ventila-

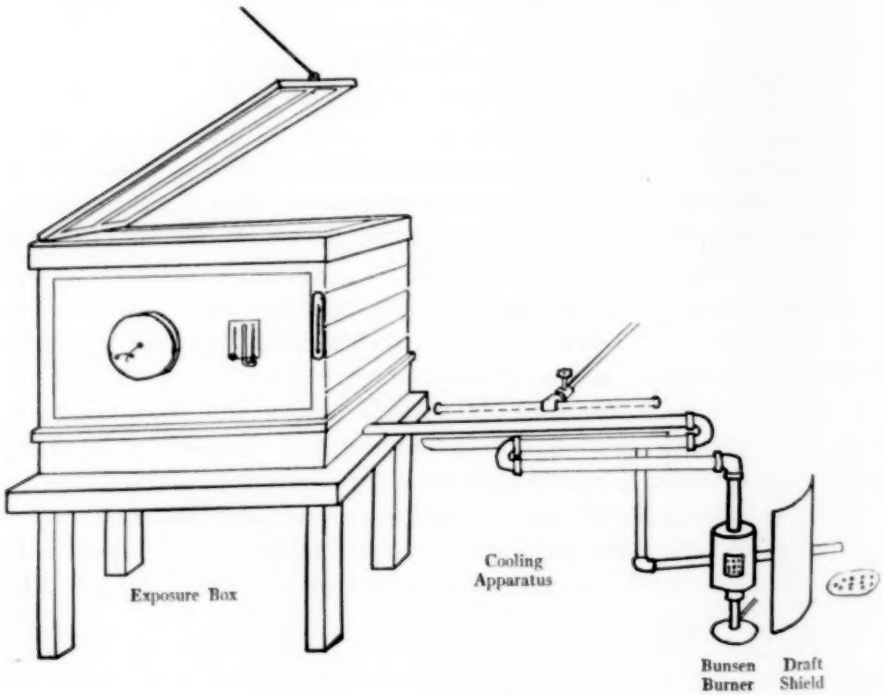
* Those who participated in the research directly, though at different periods as a rule, were George W. Bond, instructor in bacteriology; Andrew J. Kardos, graduate student in bacteriology; Dr. R. F. Jukes, instructor in bacteriology; Leo Eye, chief bacteriologist, State Laboratories; Fred Berry, Director of State Laboratories, and K. K. Kountz, metallurgist with Prof. D. J. Demorest.

tion was positive and fairly active. All cages were cleaned once daily when the lid on the exposure box was opened and the atmospheric condition temporarily disturbed. Abundant food was supplied to both groups.

Analyses of the products were made for carbon dioxide, oxygen, and carbon monoxide, although it was the intention to keep carbon monoxide absent. Various atmospheric compositions were easily maintained as desired, although on two or three occasions in the early months of the investigation monoxide was produced and promptly killed the rats under exposure.

It was first necessary to feel out the tolerance of the rats, using both sexes, and medium to large sized animals. This was done by gradually increasing the percentages and lengthening the periods of exposure to the combustion products indicated. This part of the investigation occupied the first 10½ months, or until April 30, 1927. It is to be noted that Hermans [7] demonstrated that an atmosphere containing 15 per cent of oxygen and 2 to 4 per cent of carbon dioxide is not toxic. Such would especially apply to burrow animals like the rat.

After having sensed out the tolerance to various concentrations with both high and low temperatures, and over many days of exposure,



animals were inoculated intraperitoneally with a strain of the same Type I pneumococcus (obtained from the New York State Laboratory) as was used by Spaeth and his coworkers, above referred to. Our bacteriologists found the m.l.d. of this strain difficult to control or rather to maintain when once found, so that there was constant danger of killing all the rats—both exposed and control—or of killing none in any given inoculation series.

Space does not permit of the inclusion of the protocols and other data of the various runs and inoculation experiments, but copies of same are available to those interested. In all, 7 tolerance experiments varying from 21 to 111 days and 3 inoculation experiments were made. A typical example of a tolerance experiment is given herewith:

EXP. H.—*Tolerance experiment (similar to Exp. C)* followed by third inoculation experiment*

This experiment got under way with new and improved equipment July 9, 1927, the plan being to run an exposure of at least 100 days under the same general conditions as the two preceding experiments (F and G). A batch of 19 young adult white rats was put into the exposure box. The controls consisted of 8 similarly aged normal rats.

TABLE I

TOLERANCE EXPERIMENT (SIMILAR TO EXP. C)* FOR 111 DAYS.

Dates	*No. of Days*	*No. of Rats*	*CO_2 Per cent*	*O_2 Per cent*	*Temperature Range*	*Remarks*
July 9 / Oct. 28	111	Exposed: 19 Control: 8	3.4 to 4.0	13.8 to 15.1	(a) *Exposed:* 53°-88° F. *Control:* room summer temperature	3 rats died in first 2 days. These were replaced on 4th day
July 18						Litter of young born in exposure cage
July 20						Young rats apparently eaten by others in cage
July 27	18					1 exposed rat died
Aug. 8	30					2 exposed rats died
Sept. 10	63					1 exposed rat died
Sept. 15	68					1 control rat died
Oct. 1-24	83–107					4 exposed rats died
Oct. 28	111					11 exposed rats remain 7 control rats remain

* Determining tolerance under markedly abnormal atmospheric conditions but within room temperature ranges.

On post-mortem none of the rats showed evidences of pneumococcus infection. The lungs were apparently normal. The cause of death was undertermined.

Comment—It will thus be seen that 8 of the 19 rats placed in the exposure box died during the period of 111 days, during which time only one of the 8 control rats died.

INOCULATION EXPERIMENTS

EXP. F. *First inoculation experiment* (April 30, 1927)

Here the 4 long-exposed rats (61 to 175 days), the 3 other exposed rats (26 days), and the 7 control rats remaining (mentioned in Exp. E), were inoculated by intraperitoneal injections, using 50,000 pneumococci per gram of body weight. Results:

Six out of the seven exposed rats died within 48 hours of the time of inoculation. Of the control rats, one died out of the seven inoculated.

A further pair of control rats was inoculated at the same time, using twice the dosage of pneumococci. Both of these rats died within 24 hours, showing the potency of the suspension used.

All the dead rats were examined at autopsy and cultures from the heart's blood taken. The cause of death in each case was septicemia and peritonitis; lungs crepitant throughout and the separate lobes floated freely on water.

Second inoculation experiment (May 26, 1927)

The same strain of Type I pneumococcus used in previous experiments was injected by the intraperitoneal route. This strain was, however, of a lower virulence and was found by tests to require a heavy dosage to kill, which it did ordinarily in 48 to 72 hours instead of within 24 hours. This was considered an advantage. One c.c. of standardized suspension in salt solution was injected per 100 grams of body weight:

One rat only of the exposed group died; this was on the second day.

One rat only of the control group died; this was on the third day.

On autopsy, pneumococcus was isolated in pure culture from the heart's blood in each case. No gross evidence of pneumonia.

None of the remaining inoculated rats in either the exposed or control groups died. They were alive and in good condition on the sixth day.

Comment—From this experiment it can only be concluded that, in the face of preliminary virulence tests, lethal doses were not used. Also it is possible that there was no material difference in susceptibility in either of the groups because the period of exposure for the test group—21 days—may have been too short. Possibly both factors were operative. At all events, the results were unsatisfactory from any point of view. The experiment, however, shows the difficulty encountered on the bacteriological side of the question in developing a just-sub-lethal dose for normal rats.

Third inoculation experiment

The 11 exposed rats remaining and the 7 regular control rats, to which 4 new rats were added to bring the controls up to 11 rats for inoculation purposes, were inoculated on the afternoon of October 28, 1927, and the animals returned to their respective quarters. In order to be certain that no changes of a lethal character might supervene in the gaseous exposure mixture and thus inadvertently kill off the inoculated exposed rats, a second cage of 6 normal rats was also placed in the exposure box. These 6 rats remained in good condition up to the time the last test rat was taken out, i.e., 89 hours following the inoculation.

The same strain of Type I pneumococcus used in the previous experiments was

again employed. Preliminary tests through several series of rats showed that the strain had increased in virulence since the last inoculation experiment, May 26, 1927—156 days prior. Following Spaeth's method of a definite routine in the animal passage, incubation of the freshly isolated culture, storage of this culture in the icebox, and preparation of a new culture for injection, both saline and broth suspension were obtained such that 0.001 c.c. per gram weight killed one out of three rats in each test experiment.* As the result of numerous preliminary tests, it was felt this was as near the desired result as could be obtained. Therefore, 0.001 c.c. per gram weight of animal of the saline suspension was utilized for the final test series.† Injections were made intraperitoneally as before. The results of the inoculations are shown in Table II:

TABLE II

THIRD INOCULATION EXPERIMENT

Time following inoculation	*Exposed rats*	*Control rats*
21 hours	2 died	
27 hours	1 died	
34 hours		1 died
40 hours	3 died	
42 hours		1 died
48 hours	1 died	
55 hours		1 died
70 hours		1 died
72 hours	3 died	
76 hours		1 died
82 hours		1 died
89 hours	1 died (the last one)	
100 hours		1 died
5 days		1 died
7 days		1 died
8 days		1 died
26 days		1 still alive
Total	11 rats	11 rats
Median time of death	40 hours.	91 hours.

Of the *exposed* rats, 5 were males, 6 were females. Their average weight before injection was 185 grams; average weight after death 167.4 grams. These rats showed a steady decline in physical conditions in each case following the inoculations until death occurred.

Of the *control* rats, 6 were males, 5 were females. Their average weight before injection was 200 grams; average weight after death of 10, plus the one rat which remained alive, was 182 grams. The first 3 of these rats to die showed a steady decline following inoculations until death occurred. With the remaining 8 rats, a distinct rallying period occurred after about the 60th hour. They began to eat and to move around, so that recovery seemed imminent. However, they later slumped, except one which survived throughout, and died at the hours or days stated (see Table II).

Upon post-mortem, 5 of the 11 exposed rats, and 2 of the 11 control rats showed a distinct purulent broncho-pneumonia, although the lung tissues floated in water

* In the case of the saline suspension, the rat showed signs of physical decline on the third day and died in 5½ days. With the broth suspension, the rat died on the third day.

† The standardized saline suspension contained 5 billion pneumococci per c. c.

in all cases. Smears made from the heart's blood showed abundant pneumococci in all cases.

Comment—From this experiment it will be seen that:

1. Eight out of the 19 exposed rats died during the period of 111 days' exposure to the combusion products of the Bunsen burner (as described), whereas only 1 out of 8 control rats died during this period. Post-mortems failed to explain this increased tendency to die, but pneumonia was not the cause.

2. Ten of the exposed rats which were also inoculated with the standardized dose of Type I pneumococcus died within 72 hours, as against only 4 of the control rats similarly inoculated; also the latter showed a tendency to recover provided they lived after 60-70 hours, and 5 survived for 5 or more days. It is evident also that despite the preliminary tests for virulence of the saline suspension used, the dosage was ultimately lethal to the normal (control) rats.

SUMMARY OF INVESTIGATIONS

1. Through the coöperation of a number of scientific agencies an investigation was made to determine the susceptibility to pneumonia on the part of white rats as influenced by the breathing of completely oxidized combustion products from a carbonaceous fuel, viz., fumes from a Bunsen burner using natural gas (which contains no carbon monoxide). The conditions simulated the breathing of burned gas fumes in a room having an unventilated gas stove.

2. The intricacies of investigative work were bacteriological and metallurgical, and credit for same should be given to those named rather than to the writer.

3. Experiments to determine the tolerance to increasing amounts of the combustion products in question were started June 17, 1926, and continued to October 28, 1927. Here it was found that, where room temperatures prevailed (50°-88°F.), the experimental animal—the common laboratory white rat—is fairly tolerant for upward of 100 days and more to an atmosphere containing 3½-4 per cent carbon dioxide, 14-15 per cent oxygen, water vapor to saturation, and, in one experiment, to the addition of pulverized coal dust to the above for 35 days. With lowered temperatures (41°-68°F.) broncho-pneumonia appears to supervene readily.

4. In a collateral investigation it was possible to isolate a strain of Type I pneumococcus of fairly controllable dosage and to use this in three inoculation tests of white rats previously exposed for varying periods of time, viz., 90 days, 21 days, and 111 days, respectively, to the concentrations of combustion products indicated above. In this, our bacteriologists followed in general the method devised by Spaeth and coworkers of Johns Hopkins University in their studies of fatigue and starvation as related to pneumococcus infections. However, this difference in results occurred: where Spaeth reports lobar pneumonia, even with a critical period, following peritoneal injections, we found only occasionally purulent broncho-pneumonia, but chiefly septicemia (pneumococcicemia) and peritonitis. However, death was due to pneumococcic infection.

5. The inoculation of our first experimental rats which had been exposed for periods varying from 26 to 175 days resulted in the death of 6 out of the 7 exposed, whereas control rats given similar dosages had but 1 death out of 7. A second experiment in which the rats were exposed for only 21 days resulted in indefinite findings since but 1 rat out of each group of 7 succumbed to the infection pointing to a sublethal dosage. A third experiment extending for 111 days and using an initial batch of 19 rats in the exposed group had 8 of the rats die during the period of exposure while but one of the control group of 8 rats died during the same period.

Furthermore, after inoculation of an unintentionally too virulent dose the remaining 11 exposed rats died between 21 and 89 hours (median 40 hours), without any signs of rallying at any time, whereas 10 of the 11 control rats died between 34 hours and 8 days (median 91 hours), several tended to recover, and 1 survived.

CONCLUSIONS

While we have direct evidence that rats are surprisingly tolerant of the prolonged breathing of completely oxidized fuel combustion products (as from an unventilated gas stove) rich in CO_2 and O_2, etc., upwards of one-third of them die from undetermined causes during a period of exposure varying from a few to 111 days. Furthermore, upon inoculation of the remaining exposed rats with a standardized suspension of Type I pneumococcus, they succumb much more readily than do control animals, pointing to a lowered resistance as the result of such exposure. However, more experiments are needed to warrant definite conclusions.

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Warring Against Trachoma in Argentina

THE Argentine Red Cross is undertaking an active campaign against trachoma. A model dispensary for the treatment of trachoma in its early stages will be established in every school, and a body of Red Cross nurses who are specialists in the treatment of infections of the eye, coöperating with the national department of health, will examine the school children, visit them in their homes, demonstrate methods of prevention, report new cases discovered, and arrange for their examination and treatment. Lectures on diseases of the eye and their prevention will also be given for teachers and the general public.

Program and Preliminary Results of the Committee on the Grading of Nursing Schools*

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THE HISTORY of nursing education shows that progress in this field has generally come as a direct response to unusual services rendered to an individual or to the community, by a nurse or group of nurses. It is natural and inevitable that society should wish to provide facilities for the training of a class, the value of whose service has been recently and clearly demonstrated. The most important single event in the chronicles of nursing education, the foundation of the training school at St. Thomas's in London, expressed the gratitude of the British people for the revolution wrought by Florence Nightingale; and throughout the land there is many a school which owes its strength to the appreciation by some influential individual patient of the skill and devotion of some individual nurse.

To the members of the Public Health Nursing Section of the American Public Health Association it must be a peculiar source of gratification to recall that the remarkable advances in nursing education which have been made during the past 5 years owe their inception in peculiar measure to a realization of the unique public service rendered by the public health nurse. It was the Committee on Nursing Education, supported by the Rockefeller Foundation, which took the first step in this recent forward movement; and this committee was originally constituted with an increase in quantity and quality of public health nursing as its primary objective.

I have called the report of this committee, and that of its executive officer, Josephine Goldmark, R. N., the first step in our recent campaign for the improvement of nursing education, and I believe this to be the case. For the first time in the history of nursing, a joint committee, including some of the most eminent physicians of the country, adopted without a dissenting voice a report in which, among others, the conclu-

* Read before the Public Health Nursing Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

sions were drawn: that, while the use of a less qualified attendant might be justifiable and advisable in certain types of chronic illness and convalescence, the care of acute and serious illness and the teaching of hygiene to the individual in the home can only be safely carried on by a person of high educational qualifications; that the education given in the average hospital training school is often inadequate and irregular and unrewarding; and that this condition can only be remedied by providing funds for nursing education and direction of nursing education which will insure the pursuit of an educational aim—undeflected by demands of hospital administration which may run counter to such an aim. The committee report placed this fundamental issue clearly, and frankly, and with weight of medical and nursing authority, before the public. It led directly to the independent University Schools of Nursing at Yale and Western Reserve and it laid the basis, indirectly, for a general effort to improve the status of the education of the nurse.

The Committee on the Grading of Nursing Schools is, from a purely logical standpoint, the natural next step in such a program of advancement. Historically, however, its origin was a wholly different one and it is constituted in a very different fashion from the Committee on Nursing Education and is bound by none of the implications of the work of the earlier body. The present study was organized as a result of the appointment by the American Medical Association of a committee to confer with representatives of the League of Nursing Education, which had long been working on the problem, and to devise a combined method of attack. After preliminary conference, the Committee on the Grading of Nursing Schools was organized as a formal body, primarily made up of official delegates from the 7 national organizations interested in the problem as follows:

The National League of Nursing Education, Elizabeth C. Burgess, R. N., and Laura R. Logan, R. N.

The American Nurses Association, Helen Wood, R. N., and Susan Francis, R. N.

The National Organization for Public Health Nursing, Katharine Tucker, R. N., and Gertrude E. Hodgman, R. N.

The American Medical Association, William Darrach, M. D., with Winford H. Smith, M. D., as alternate.

The American College of Surgeons, M. T. MacEachern, M. D., with Allan Craig, M. D., as alternate.

The American Hospital Association, Joseph B. Haviland, M. D., with William H. Walsh, M. D., as alternate.

The American Public Health Association, C.-E. A. Winslow, Dr. P. H., with Lee K. Frankel, Ph.D., as alternate.

In addition, 6 members at large have been added to the committee, Mrs. Chester C. Bolton, representing the viewpoint of the patient and the hospital trustee; S. P. Capen, W. W. Charters, E. A. Fitzpatrick,

M. D., and Henry Suzzallo, representing the viewpoint of the educator; and Nathan B. VanEtten, M. D., representing the viewpoint of the medical practitioner. The committee was extraordinarily fortunate in persuading William Darrach, M. D., Dean of the College of Physicians and Surgeons of Columbia and the A. M. A. representative on the committee, to serve as its chairman, and Dr. Darrach has thrown himself into the direction of the work of the committee with a vision and an enthusiasm which go far to insure the success of its work. Dr. May Ayres Burgess, a statistician and investigator of unusual experience, was appointed Director, and on her recommendation the committee adopted, November 18, 1926, a 5-year program for the studies which it contemplates. It was felt that these studies must cover a much wider field than that included within the four walls of the training school itself. If the grading of an educational institution is to be worth while, it must be based on very serious consideration of the purposes which such an institution should subserve. In our specific instance, any attempt at educational improvement must take into account the community need for nursing service in respect to quantity, quality and cost; for it is the real needs of the community that must ultimately govern the educational policies to be pursued.

THREE MAJOR PROJECTS

We have therefore included in our program three major projects or studies concerned respectively with:

Supply and demand for nursing service
Job analysis of nursing and nurse teaching
Actual grading of nursing schools

In other words, we want to find out first how many and what kind of nurses are now available, and at what cost, and how many and what kind of nurses should be available in order to meet vital community needs; and what kind of training these nurses should have and how that training should be given. These are large questions and we do not expect to answer any of them with finality. We do hope, however, to obtain a sufficient basis of information along these two lines to make an intelligent approach to the final problem of grading a reasonable possibility.

We plan to distribute the work on these projects in overlapping fashion over the 5-year period, completing the major part of the supply and demand study during the first 2 years, concentrating chiefly on job analysis during the second and fourth years and making progress on the grading plan each year, with special concentration upon it during the fifth year.

We estimate the cost of the supply and demand study at $42,000,

the job analysis at $72,000 and the work on the grading plan at $86,000, a total of $200,000 for the entire 5-year program. A considerable part of this budget is assured by annual contributions from the 7 parent organizations and the rest will, we feel sure, be contributed by foundations and individuals now having the matter under consideration.

SUPPLY AND DEMAND

The study of supply and demand, was the first objective to be actively attacked and during the first year of the committee's life it has been pushed forward with substantial results. We desired to find out what shortage of nursing service, if any, existed and under what conditions it manifested itself and what particular kinds and qualities of nursing service were concerned. On the one hand, it is a matter of common experience that many physicians complain of inability to obtain the type of nursing service which they need and that the public groans audibly over the cost of the nursing service which it obtains. On the other hand, Janet M. Geister, R. N., pointed out two years ago at the American Health Congress at Atlantic City* that the private duty nurse has her just ground for complaints in regard to unreasonably long hours, inadequate income and irregularity of employment. What are the facts and what is the remedy for a situation, which at times seems to be equally unsatisfactory to all parties concerned?

In order to throw some light upon these questions we attempted a very extensive study by means of questionnaires, addressed to the various parties at interest in the case, in 10 states, selected as reasonably typical of conditions in various geographical sections of the United States. The states finally chosen were California, Georgia, Illinois, Kansas, Louisiana, Massachusetts, New York, Pennsylvania, Washington and Wyoming and in these states we canvassed 5 different classes of persons: the nurses themselves, the physicians, the hospital administrators and the health officers who employ them, and a selected group of the patients who had recently received the ministrations of a nurse in hospital or home. The response to this questionnaire has been extraordinarily encouraging. Thus we have received 30,000 returns from private duty, public health and institutional nurses, with 1,456 returns from physicians and 1,209 from patients; and the results are of substantial interest and significance.

First of all, we have no evidence of a general gross shortage of nurses in any of the regions studied. On the contrary, the testimony of the physicians is almost unanimous that the general supply is ample. There

* Geister, Janet M. Hearsay and Facts in Private Duty. *Am. J. Nurs.*, 26, 7:515 (July), 1926. (Delivered before the American Nurses' Association at the American Health Congress, Atlantic City, N. J., May 18, 1926.)

is a very real and a very serious shortage of specially qualified nurses, of nurses able to do public health work, of nurses able to care for mental cases, or children's diseases; but this is a problem of quality not quantity. There is a real and severe shortage of nurses of any kind at certain times and in certain places, on Sundays and holidays and in rural districts; but this is a problem of organization. There is often a shortage of nurses to care for disagreeable and dangerous cases, individual nurses refusing to care for pneumonia or acute contagious disease or genitourinary conditions; but this too is a problem to be solved only by the development of some type of formal or informal group responsibility. That there is no fundamental and general shortage, is made clear by the fact that our average private duty nurse, during the month of March when the demand for nurses is at its annual peak, spent one day out of seven in waiting for a call.

Nor does it appear that the physicians canvassed have any fundamental criticism to make of the general quality of the nursing service which their patients actually receive. We asked each medical recipient of our questionnaire to describe one typical case in which he had a nurse working under him during the last week in March and whether he would like to have the same nurse again on a similar case. Eighty-seven per cent of the physicians answered "yes." In response to a question as to the necessity of certain special qualifications on the part of the nurse in the typical case cited, the physicians made the following highly significant response.

PHYSICIANS' REPLIES REGARDING SPECIAL QUALIFICATIONS

Quality or Type of Service	Percentage of cases in which quality was needed
Skill in giving general care and making patient comfortable	63
Skill in observing and reporting symptoms	44
Care in following medical orders	40
Good breeding and attractive personality	34
Skill in handling people	30
Familiarity with hospital routine	28
Skill in asepsis	26
Experience and background	24
Skill in giving special treatments	21
Familiarity with physician's personal methods	20
Familiarity with particular disease	16
Ability to work under heavy strain	13
Responsible adult to take charge of family	3
Mother's helper and house worker	2

Certainly, the first three and the fifth qualifications would seem to indicate the need for a fairly high type of education, in preparation for a profession in which they are to be displayed.

In general, then, I may summarize the picture presented by the reports of physicians and patients somewhat as follows—but please re-

member that in this and all other summaries and conclusions I speak only for myself as an individual, not for Dr. Darrach or Mrs. Burgess or for the committee as a whole. The conclusion would seem justified that there are enough nurses and perhaps too many nurses in the country as a whole (as evidenced by a day a week of enforced idleness even in the month of March); but that nurses are hard to obtain in rural districts and on holidays, that they are often loath to undertake dangerous and difficult cases, and that they are often not qualified for the higher types of nursing service desired. Furthermore, the cost of private duty nursing service ranging from $35 to $112, depending on type of illness and location, is unquestionably a very severe burden on the average family.

Next, what has the nurse to say about the problem? Here, our questionnaires give us a very clear answer, but one whose tenor differs markedly according to the particular type of nursing service with which we deal. It is estimated that there are some 110,000 private duty nurses in the United States, 12,000 public health nurses, and 30,000 institutional nurses. The representatives of the first of these groups responding to our questionnaire give us on the whole a rather dismal picture of this sector of the field. They find the burden of 24-hour duty (prevailing in 56 per cent of our cases) unbearably heavy, an undue tax on their physical strength, and an almost insuperable bar to normal human relationships. During one week in March the average private duty nurse lost 0.35 days on account of illness, the public health nurse 0.13 days, the institutional nurse 0.09 days. The general distribution of time for the week is indicated:

TABLE I

DISTRIBUTION OF TIME LAST WEEK OF MARCH

	Private Duty Nurse Days	Public Health Nurse Days	Institutional Nurse Days
Work	5.1	5.7	5.9
Rest	0.5	1.2	1.0
Waiting	1.0		
Illness	0.4	0.1	0.1
Total	7.0	7.0	7.0

In Dr. Burgess's words, the private duty nurse worked less and rested less; but worried more and was sick more.

The second point, also brought out by Table I is irregularity of employment; and it is this irregularity of employment which in large part accounts for the fact that while private duty nursing is costly for the patient it is also unremunerative for the nurse. The main facts in this regard are brought out in Table II.

The private duty nurses begin work at about $1300 a year and with

TABLE II

ECONOMIC STATUS

	Private Duty Nurse	Public Health Nurse	Institutional Nurse [1]
Average annual income	1311	1720	2079
Per cent reporting savings of over $1000	28	32	45
Per cent having had to borrow money during past year	14	8	3

1. $500 a year estimated as value of maintenance

occasional variation between $1300 and $1500 keep at about the same level throughout their working lives. The public health nurses start at about $1450 and rise to a maximum of $2300 after 25 to 30 years of service. The institutional nurses start at $1700 and rise to a maximum of $2500 after 15 years of service.

The private duty nurse on the whole is either overworked or idle; with the net result that her income and her savings are small and her debts large; and, what is perhaps most serious of all, she has no future, nothing to look forward to, for her income and her general status are worse rather than better after 25 years of service than in the year after her graduation. It is no wonder then that but 55 per cent of the private duty nurses canvassed announced their intention of continuing in the work, against 86 per cent of public health nurses and 82 per cent of institutional nurses. You see that your kind of nursing—our kind of nursing if you will let me call it such—is somewhat less profitable financially than institutional nursing but yet seems to yield an even higher satisfaction.

Here, are the sorts of things the public health nurses report on the back of their questionnaires:

I am doing school nursing and am very happy in it. It exceeds by far any other kind of nursing I have done. There is time enough outside of my work so that I can have other interests, and in that way life does not become monotonous and I can have friends which I found impossible to do when I was doing private nursing. My health is very much better as my hours are regular. I can get the proper amount of sleep uninterrupted and I am out of doors part of the time since I make home calls. My daily associates are very agreeable since I come in contact with teachers who serve as mental stimulus. In general, life seems very much worth living.

In my position as county tuberculosis nurse which includes school nursing I guess I feel the thrill of covering the whole county and sort of mothering the whole county, whereas before my efforts were usually confined to one patient at a time. The interest in public health nursing is so far-reaching, and has so many angles that it surely holds your interest and never lets that interest wane.

Public Health Nursing will be my life work; only I hope to be able to take the course at the university and be more competent. I like it better than anything I have ever done. I have been in my present position ten years. You can do more for humanity in it than in anything else in the world.

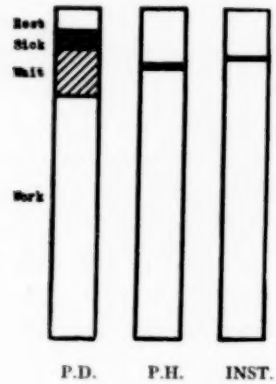
This is all very gratifying to us as public health workers but the status of private duty nursing is gravely disquieting. What is the answer to the problem?

Clearly, it is not a mere increase in the number of women practicing a profession under conditions so unsatisfactory that barely half of those now in the field desire to continue in it. Equally clearly, as it seems to me, the solution must be found in better organization of the nursing service now at our disposal. Is it not obvious that the whole system of 24-hour nursing in the home by nurses working on a purely individualistic basis is bound to be costly to the patient and arduous and unrewarding to the nurse? Is it not obvious that better organization of the care of the sick will remove some of the objectionable features of the present plan by placing a certain proportion of the acutely ill, now cared for at home, in hospitals under group nursing care, and by handling another fraction through a considerable extension of the principle of hourly nursing? Is it not obvious that better organization of private duty nurses themselves will obviate most of the other difficulties, by distributing the total volume of nursing service as between city and country, by coördinated effort to cover holiday service, by intelligent selection of the type of nurse to fit the special case, by the cultivation of an *esprit de corps* that will prevent the scandal of refusal to take the responsibility for a difficult or a dangerous case?

I think the answer to these questions must be in the affirmative. When we come to the question how such organization can be effected there will be less unanimity. Shall it be accomplished by using the existing public health nursing organization in each community as a nucleus, or by the expansion of the functions of the Central Registry, or by the creation of a new coöperative organization of the private duty nurses themselves? Speaking for myself and not for the committee, I believe that the public health nursing organization is the agent for this work, and that if the public health nursing organizations do not rise to the opportunity, the whole cause will suffer immeasurably. If the organization of private duty nursing is to be effective, it must be carried out first of all with the interest of the public as a whole primarily in view; and secondly, it must be carried out with reference to the highest standards of professional performance. The public health nursing organizations are "public service corporations" in the highest sense of the term and they are the only organizations which have the supervisory force to make a community nursing service work, and work with success.

If the registries were to undertake the task they would be forced to build up a duplicate supervising staff, which would be wasteful and

almost impossible in view of the limited supply of qualified persons; and if by any miracle they succeeded the result would be to create parallel community nursing services, one for the rich and one for the poor, an outcome which would set our whole movement back ten years or more. What I hope may happen is that by the development of hourly nursing through the regular visiting nurse staff, by coöperation with the registry, and perhaps by the organization of a sort-of reserve corps of nurses available for 8 or 12 or 24-hour service—whether on a

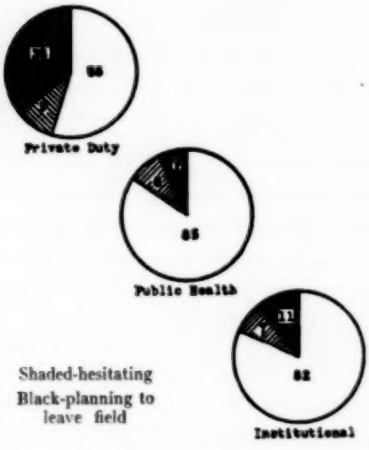


THE TYPICAL MARCH WEEK

Private duty nurses worked less, worried more, were sick more, and rested less than the nurses in the other two groups.

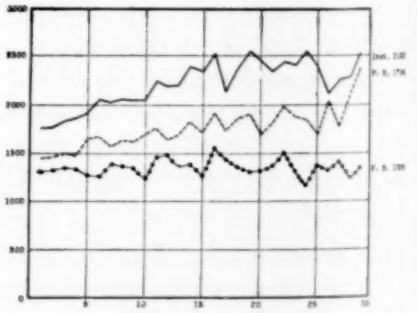
DAYS TOO SICK TO WORK

Each circle represents a day. During the week studied the typical private duty nurse lost 0.36 of a day because of sickness; the public health nurse lost 0.13 of a day; and the institutional nurse 0.09.



KEEP ON?

"Do you intend to continue indefinitely in this type of work?" Of the private duty nurses 55% plan to stay and 45% are either hesitating or definitely planning to leave the field. Among public health nurses the corresponding figures are 85% and 15%; and among institutional nurses 82% and 18%.



YEARS OUT AND YEAR'S PAY

Average salaries received by private duty, public health, and institutional nurses who have been out from training school each number of years. (Institutional salaries include a flat allowance of $500 a year for maintenance.)

salary basis or not I do not know, but all under sufficient supervision to guarantee adequate standards of service—by some such means as this, I hope to see nursing service in the homes of rich and poor, whether on a visit, an hourly, or on a daily basis, developed into one coördinated scheme of effective community service.

It is no easy task—perhaps it is an impossible task! I cannot but feel, however, that the problem is more likely to be solved by the visiting nurse associations with their prestige and with their command of so much of the best organizing ability of nurses and of lay directors than by any new organizations which might conceivably be developed for the purpose. It is because this problem presents so direct a challenge to many of the members of this section that I have dealt with it in so much detail.

JOB ANALYSES OF NURSING AND NURSE TEACHING

I must refer very briefly to the other two projects of the Grading Committee which as yet lie in the future. If the supply and demand study should indicate, as I suspect it may, that the community can get along with less rather than more nurses if their service is properly organized, but that a higher, rather than a lower, type of education is needed for the fulfillment of the demands of an adequate community program, we must next proceed to find out, so far as we can, what knowledge, training, capacities and qualities the nurse must have for success and how, and how far, these can be developed by education.

The method for doing this is what is known as job analysis! This means that we discover what a nurse should be like by studying her in action and seeing what she has to do. We list what she does, discover what problems she faces, and learn what she needs to know in order to meet them. When a careful analysis has been made of what the nurse needs to know and be, we then proceed to the second, and far more difficult process of analyzing the elements in the job of teaching her so that she will have these qualities.

This alluring, but very subtle and complex, task will be the major task of the committee during 1929 and 1930.

GRADING OF NURSING SCHOOLS

Meanwhile, however, the actual grading program will be worked out in parallel with the two study projects already discussed; and it is our plan to approach it along the following lines. To grade the 2300 training schools of the country on the basis of inspections would be enormously expensive and to grade them on the basis of the expert judgment of an inspector would require an inspectorate of an impossibly high caliber and would in any case provoke the defense reactions inevitably aroused by subjective criticism. The only solution would appear to lie in the use of relatively simple schedules of objective facts,

somewhat like the *Appraisal Form* of our Committee on Administrative Practice. Our task is to prepare a schedule which can be filled out at each school, by the authorities of the school itself, preferably with the aid of a representative of the committee, to serve not at all as an inspector but merely as an agent to explain the schedule and to secure uniformity in the interpretation of its items.

We hope to secure data on such a schedule for each of the 5 years covered in our study, beginning for 1927 with a few very simple and easily attainable items and including each year more items, and items less likely to be found in the machinery of the less developed schools.

So much for our method of obtaining the fundamental data upon which the standing of the schools will be ultimately based. How shall we set the standards to be met and how shall we grade the schools on the basis of the information thus obtained?

We shall not set any standards at all and we shall not grade the schools. We shall let them automatically set their own standards and automatically grade themselves. We shall, at the outset at least, publish no data for individual schools. We shall publish the distribution of schools by states in respect to each item studied and we shall inform each school where it stands on each item with respect to its fellows. Later on, as the schools begin to show improvement, it is possible that the names of those schools ranking in the highest third, or above some other determined level, may be announced. In any case, however, the standard of attainment will be set, not by the committee, but by the actual performance of the group as a whole. It will be a self standardization of the schools, by the schools, with the committee serving as a medium of intercommunication.

We believe that this plan will obviate any injustice to the weaker schools and will at the same time, through the force of emulation, produce a stimulus to improvement of almost incalculable force; and there is the added advantage that as the work of the schools improves standards will automatically rise. The program is on exactly the same general basis as the appraisal of community health service by the Committee on Administrative Practice which has notably succeeded in a constructive stimulation toward improvement without discouraging the more laggard and without checking the progress of the more advanced by standards which are fixed and arbitrary. We believe that this task, so performed, will offer the most powerful practical stimulus to the improvement of nursing education and will thus vitally serve the general cause of public health. We trust that the American Public Health Association may continue to support the work of the Committee on the Grading of Nursing Schools with this end in view.

Health Policies for Control of Public Water Supplies*

IN ITS REPORT for 1927 our committee has tried earnestly to comply with the instruction of the Committee on Committees to avoid overlapping the work of other committees interested in a similar topic. We are in thorough accord with the policy and hope future committees may, even voluntarily, be guided by it. However, it must be admitted that the specification adds to the difficulty of preparation of a report. Offsetting this, we are particularly favored in having Secretary A. E. Gorman suggest the title and treatment of the report we are about to make.

At the outset let it be said the report is less technical than in former years and is not so embracive as its title might imply. It contains but brief reference to lines of policy or attitude toward a few of the problems appearing on the horizon for health officers or departments supervising water supplies.

First let us return to an old theme—the establishment of team-work between the health department and the water department. Water works employes need and want help and encouragement. It is unbecoming that the health officer should resort to high-handed supervision. Furthermore the courts in recent years have relieved health departments of much of the need of police regulation of water supplies through the frequency with which they have assessed damages against negligent water works. The health officer's task is made more pleasant and fruitful if he will simply capitalize the eagerness of the water department to do the right thing. With a united front both the health department and water department will get better consideration from their superior officers. Divided, they furnish ammunition for the politician.

SIMPLE CONTROL TESTS

The water department, like any other, is much benefitted by having a yard-stick with which to measure the results of its effort to produce a safe supply. Since chlorination is now so common a safeguard against contamination, the free chlorine test is especially valuable. With a few exceptions the test is simple, and with care to apply the test

* Report of the Committee on Water Supplies, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 20, 1927.

to reasonably clear water, its results are exceedingly reliable. The test ought to be almost universal where water is chlorinated.

Next in order of practicability is the test for *B. coli*. If the water department can support a proper laboratory it should carry on its own *B. coli* control with only an infrequent check by the health department or state laboratory. If the water department cannot support such a laboratory the health department may have to handle the test as a routine matter, and if possible also the sampling. The better the grade of sampling the more constructive the test becomes, because the sampler can then correlate the operating conditions against laboratory results. Too often health departments leave sampling to mere errand boys.

Whoever makes the tests should be sure of the technic used and know how to interpret the results. The present *B. coli* standard is admittedly a very strict standard, but it is doing excellent work in making water departments more particular. In many parts of the country, however, where soil wash is a factor, *B. aerogenes* may completely confuse the interpretation. Some years ago anaerobic and aerobic spore formers also led to incomprehensible results. There is still much obscurity in the meaning of the appearance of *B. coli* in tap samples, the freshly treated water evidently being always safe.

The point in noting these exceptions is that water bacteriology is not on a plane where one can accept its findings with too much positiveness, especially if indicative of contamination. The water department may easily lose confidence in the health department if the results manifestly disagree with what common sense or experience would tell. An unfavorable result should therefore be the occasion for an open-minded, judicious inquiry as to what caused the apparent contamination. First feel sure of the laboratory end of the work and the sampling. Then, with the water department, try to run down the explanation. Unfavorable tests are most valuable when they lead to betterment in plant or operation.

OPERATING RECORDS

This leads us to remark on the value of keeping good operating records and we bespeak coöperation between the two departments in devising as simple a report system as the circumstances admit. It is easy to wander into framing complex record forms which so provoke the practical operator that they are not kept well or kept at all. It takes coöperation and familiarity with operating conditions to devise a usable, simple record sheet which tells just the essentials. The minimum record is one showing that chlorination doses have been reasonably uniform and results consistent. At the other extreme is a form

showing also the various factors influencing chlorine demand and condition of the chlorinator as well. But the record must be a truthful story of what actually happened, as far as is known.

Health departments should require the submission of summaries of the report at intervals to be determined by the weaknesses in the system. Except in emergency, a daily report to the health department is not warranted, and in fact defeats its purpose, which is to give the health department a bird's-eye view of plant functioning and an opportunity to scan for dangerous tendencies in operation. The water department is interested in the detailed results. The health department looks for evidence of glaring or suspicious faults in operation. Erratic operation is always suspicious, but so also is operation which is too even to be truthful.

SANITARY SURVEYS

Regardless of the kind of water works, every health department ought to become thoroughly familiar with the sanitary environment, safeguards and weaknesses of each supply under its supervision. The survey is indispensable as a means of gaining first acquaintance, and if thorough it will detect the hidden opportunities for future trouble. Moreover, the survey needs to be repeated from time to time—like the annual health examination which the modern physician is constantly holding up to us. This cannot be any superficial investigation. It must be thorough. Even then a condition may slip by unnoticed and lead to catastrophe later. Here is no place to elaborate on what a sanitary survey would constitute. It is too broad a subject for general discussion. If there is no one locally trained in sanitation of water supplies, the state sanitary engineer should be invited to undertake the job or suggest a procedure.

WATER CHLORINATION

Chlorination, even as now practiced, can take credit for a large part of the striking reduction in typhoid throughout the country. Yet its introduction has been notoriously not along conservative lines. The set-up is seldom in duplicate or calculated to guarantee continuity of service. We suspect that even now if faulty water chlorination were as strikingly shown as an interruption in power supply when the lights all go out, some startling evidence would appear. In its field, chlorination is quite as unique as power in the dependence placed upon it. Is it not singular that in the remainder of the water and power systems of the country you will find duplicate pumps, boilers, electric supply lines and duplicate service pipes; yet seldom indeed do you find a duplicate chlorination set-up? Sometimes duplicate parts for chlorinators are on hand, but there must be an interruption in chlorination while the sub-

stitution is being made. Now the additional precautions for continuous safety are simple and relatively inexpensive.

Many water works are not protected against the infrequent emergency. It is true of water works in general and of chlorination in particular, that the precautions depended upon must not merely take care of average conditions but be adequate to meet the severe emergency which might occur perhaps only once in five or ten years. Chlorination as it stands today is, in most cases, under just a mediocre control.

These considerations prompt the committee to report rather fully the exemplary precautions in chlorination taken by the City of Chicago under the direction of A. E. Gorman. No doubt there are other notable chlorine installations, but this one will serve to illustrate the care involved in good chlorination.

The set-ups at Chicago are predicted on the principle that every drop of water sent to the consumers needs adequate chlorination. The result of following the principle in that city has been one of the lowest typhoid records of any city in the country, where formerly outbreaks appeared every few years. The cost to consumers for this chlorination is triflingly low—a little over 5 cents per person per year.

Factors influencing chlorine demand, such as algae, pollution, temperature, pumpage, etc., were first evaluated and a chlorine set-up adequate to feed 6.5 lbs. per m.g. at maximum pumping period decided upon. A complete unit is installed in one booth, which is protected against temperature variations, and this is all duplicated in another booth. Leaks in one booth therefore do not hamper use of the other. Booths have vent systems, and gas masks kept ready for use are nearby in a special locker. Tank batteries are made up and set on scales in the booth. The number of cylinders is determined by the rule that the feed must not exceed 40 lbs. per tank per day. To guard against empty tanks it is not attempted in Chicago to use all the chlorine. The tare weight is known and the cylinders are replaced while there is still a pound or so of chlorine left in the cylinder. Batteries are so drawn upon that no two can run out within 6 hours of each other. In Baltimore the cylinders in any one battery all set on separate scales and cylinders are so put in service as to avoid all running empty at the same time.

Scales for weighing the chlorine are set flush with the floor to avoid damage due to impact. Scales are periodically tested for their accuracy.

Duplicate header systems run from both booths and connect to each battery and each chlorinator, all properly valved for control. Likewise the chlorine feed lines are in duplicate and points of feed are chosen so that the effect of a change in dose can be immediately felt. Water flow

rates are known at all times. The type of machines used prevents stoppages in feed lines and diffusers in cold weather and cold water.

Lines from the scales to the header are so arranged as to avoid transferring coil pressures to the scales, which would make weights incorrect. Machines are overhauled when a battery is out of service.

Chlorine attendants are on hand constantly. These men have been schooled in the machines and in chlorine tests. They keep the installation in good working order, test the treated water for residual chlorine every hour or more often in emergency, and attempt to keep the residual chlorine at 1 lb. per m.g. as it leaves the plant. They also keep records of operation.

The health department of the city performs the bacteriological work on samples it collects daily from the raw water, from each plant, and from several points in the distribution system.

Control of chlorination to guard against overdose, underdose, and tastes, is difficult when the set-up is at the head of a distribution system, as at Chicago, and subject to the effects of water draft and a fluctuating demand. The new installations will be automatic, the chlorinators being actuated by the water flows, thus getting away from at least that important variable. In systems where balancing reservoirs are used, and there are a few feet of head available, it is possible to precede the balancing reservoir with another just adequate to take the daily fluctuation, the inflow being constant for a day. In this case chlorine is applied to the constant inflow.

The committee is not prepared to advocate the chlorination of all water supplies, but it does favor a thorough job of chlorination where that method is indicated.

There is a growing number of supplies where the pollution load is heavy for so frail a precaution as is chlorination in practice. Such supplies, as a rule, suffer also in physical impairments. Health officers may well support the water department in agitation for water filtration in such places.

WATERSHED SANITATION

In watershed sanitation it appears to us that there is special need for health departments to have a more settled attitude, especially in control of recreation. In parts of the country supervision is woefully inadequate, left in the main to an innate sense of decency of recreationists themselves. In other states, as in New Jersey, regulation has swung too far against public opinion. At the instigation of a number of cities, regulations were adopted by the New Jersey State Board of Health at the close of 1926 forbidding bathing or the maintenance of bath houses and places of entertainment which would pollute water supplies. A

few months later the representatives of pleasure resorts, recreationists and land owners succeeded in having put into law, over the governor's veto, a bill which legalizes bathing in the waters of that state.

The pendulum must soon swing to a position more compatible with the various opposing uses of the watersheds. With typhoid disappearing and community water supplies coming more and more under treatment, the course health officers will take is apt to be decided on the score of decency more than anything else, considering all parties concerned in a clean watershed, and realizing that there is always reaction against restrictions in which the public does not have full credence.

It was not long ago that there was considerable resort to universal ownership of catchment areas. The doctrine of course is opposed to other uses of the watershed and its effect is to limit or totally deprive the commonwealth of pleasures or prosperity that may come from the widest harmonious use of the country's assets, of which the watersheds and streams required to supply water to our growing metropolitan areas represent a large item. The principle of watershed ownership has about reached the limit of its economic usefulness. It is tantamount to hoarding and opposed to greatest beneficial use.

In our opinion, health officers and departments must not take an extravagant position. They must look at the problem in a broad light, yet build up sentiment for decency and against abuse. They can easily appeal to the sense of cleanliness and fair play in a man and hence to his own self-interest. They need not let down the bars nor forego their police power, but when a broad viewpoint permeates the watershed policy the courts and the public are apt to support the health office in curbing unreasonable use more regularly than appears now to be the case.

Use of streams for sewage disposal, with more or less treatment of the sewage, has come to be an accepted, legitimate one. Water consumers have adjusted their works and their ideas to it. To the widespread recreational use of the watershed and streams, however, there is not yet the same adjustment or a settled policy. Sewage in recreational streams of course is inadmissible. For one thing it generally ruins the region itself for recreation. Swimming in streams appears now to be the most common sanitary problem and the hardest to tackle, being so generally indulged in and so slight in its sewage pollution. We suspect the real objection to it is principally a mental and esthetic one which, however, cannot be entirely overlooked.

Recreation of watersheds was one of the serious topics before the Conference of Sanitary Engineers in Chicago this year and subsequent committee reports may gradually crystalize a policy. The preliminary

discussions, however, served to show that regulation, if any, to work most fairly, must be local.

This much is certain, that water consumers cannot look to the recreationist or other users to guarantee the safety of the supply. The consumers themselves can easily make the supply safe and entirely potable. It is preposterous to deny mountain recreation to the multitudes that the consumers may be spared the inconvenience of water treatment. The health department will succeed well if it holds recreational abuse in bounds and preserves such a degree of cleanliness as the pleasurable uses themselves dictate.

Water departments have, in various parts of the country, adopted a more coöperative attitude toward permanent residents on watersheds in helping to maintain a high degree of sanitation, the department often furnishing plans, the material or even labor. It will be well to meet this new recreation problem in the same way. Without encouraging recreation unnecessarily, sanitary conveniences can be provided in whole or in part and appeals made which will promote a high standard. In some cases, in coöperating with owners of the land, fencing can be done and the public thus kept off.

CROSS-CONNECTIONS

As a closing topic for this report the committee directs attention to what it regards as a retardant in the program of cross-connection elimination due to rather dogmatic approach. A year or so ago water works men, underwriters, and state sanitary engineers took a definite and rather drastic stand against cross-connections. Many states have set out to eliminate them, even fixing time limits within which they must be out. It is not clear just what next move was contemplated in the event of non-compliance.

When the Health Department of Chicago first took up the cross-connection problem in 1924 and 1925, there was drawn up a drastic, prohibitory regulation. It has never been adopted. Instead, simply by inspections, more or less frequently repeated, most owners of the connections were finally made to see the possibility of harm as it actually existed in each case. The stand taken depended on how badly polluted was the secondary supply and the real extent of the menace to public health.

The regulating officer must not overlook the fact that he is dealing with lay people who have thought only of one side of cross-connections, namely, the advantage to themselves in having an augmented supply and reduced insurance rates. They may easily have overlooked the danger to health in perhaps a long experience of immunity from evil

results. If there is danger in the secondary supply, naturally the cross-connector would feel its force most. Therefore he should have the greater interest in the elimination of any real menace, if properly approached. The real reason for the existence of dual supplies is often an inadequate public one, and in such a case the main efforts should be directed at a better system.

In general, the attitude toward cross-connections is to eliminate them rather than to control them. Various states and municipalities, principally through their health departments, have adopted regulations patterned after resolutions of the American Water Works Association, Fire Protection Division and State Sanitary Engineers, prohibiting physical connection between potable public supplies and any other supply unless the secondary supply also be potable and under regular examination as to its quality. States that have given the subject a great deal of thought over many years are convinced that education and mere request for discontinuance of cross-connections are not enough and that specific, definite laws are needed, because even though the power implied in them may not be exercised frequently, the power is available to force action where lack of interest exists. The mere existence of penal provisions does not imply that everyone would resort to penalization initially, because most people can be dealt with through reason.

It is probably impossible for water departments and health departments to escape the burden of having to discover cross-connections with the distributing system, the same as they now must do in uncovering pollution acts at the very source of the supply; but with respect to parties who pollute the source of supply, misdemeanor laws, at least, are found on practically all statutes. It seems rather curious therefore that one cross-connecting to a public supply and polluting it—doubly a trespasser and a polluter—should be subject to no responsibility for the deaths or illness he causes, or to no penalties other than mere discontinuance of supply to him. So far as we know, no one has considered writing into the statutes, laws which would make it a misdemeanor to connect a private supply into a public one.

SUMMARY

By way of summary, a few of the points made in this report are:

1. Use coöperation and encouragement rather than the "big stick" in dealing with the water department.

2. See that a thorough sanitary survey is made to show how the system is operated, and ferret out all sanitary weaknesses which need watching. Repeat the survey every year or so.

3. If the supply is a chlorinated one, see that the free chlorine test at least is used. It will carry much assurance and stimulate the operator to improve his rec-

ord. Also see that the water department or the health department makes competent tests for *B. coli* and be sure of the interpretation of the results. Employ competent samplers who can correlate results against operation. Devise with the water department a good, simple record form. See that the health department gets summary reports of operation which will show dangerous tendencies and mismanagement.

4. Get away from being satisfied with mediocre results and control. Insist on a reliably safe water all the time. Guard against not only those conditions regularly bad but against hazards which occur once in several years. As for chlorination, when it is needed, insist on installations that practically guarantee the disinfection of every drop of water sent to consumers. For instance, require all installations to be in duplicate, together with interconnecting lines, and see that there is never an interruption in the proper chlorine feed.

5. What to do with recreation on watersheds is a most imminent problem. The most pressing phase is the swimming problem in water supply streams, entertainment on a large scale, and hunting and fishing. We cannot help moralizing on the happenings in New Jersey when the State Board of Health prohibited swimming and entertainment on water supplies, and the kick-back was that resort owners, real estate subdividers, and individual owners along the stream secured the passage of a law over the governor's veto that legalizes swimming and bathing in the waters of the state.

The problem is to keep down recreational abuse if only to perpetuate its enjoyment. Look on watersheds not as a single asset but as having multiple uses of value and try and harmonize all with the least inconvenience and restriction needed to preserve each one. The minimum need is for clean, decent uses of the watersheds. In recreational areas sewage pollution is dangerous and will wreck the region if not curbed. Swimming should be considered more for its uncleanly effects on the stream. As a source of dangerous pollution it is of little importance. We are equally certain that water departments can easily, and therefore must, take the balance of the burden of protecting their own supplies by adequate water purification. We also commend that they coöperate in maintaining sanitary conveniences and safeguards on watersheds from which they take their supplies.

6. The formula for dealing with cross-connections appears to lie in the adoption of local and state regulations prohibiting such cross-connections, intakes, bypasses and other dual supplies unless the same be of known potable quality. In the administration of such a prohibitory ordinance, the powers provided by such regulation are to be looked upon as a reserve measure when education fails, in particular instances. The formula must further provide for the detection of cross-connections. That is easier in a publicly-owned system than in a privately-owned one, because if the owner of the premises forbids, he can prevent the company employes from entering.

We would throw out the suggestion, further, that cross-connections and consequent pollution should be made a misdemeanor offense, the same as has long been the case with respect to acts of pollution on the watershed and other parts of the system.

C. G. GILLESPIE, *Chairman*

C. R. COX — GEO. G. EARL

W. O. HOAD — JOHN R. BAYLIS

Activities of Plankton in the Natural Purification of Polluted Water*

W. C. PURDY

U. S. Public Health Service, Cincinnati, O.

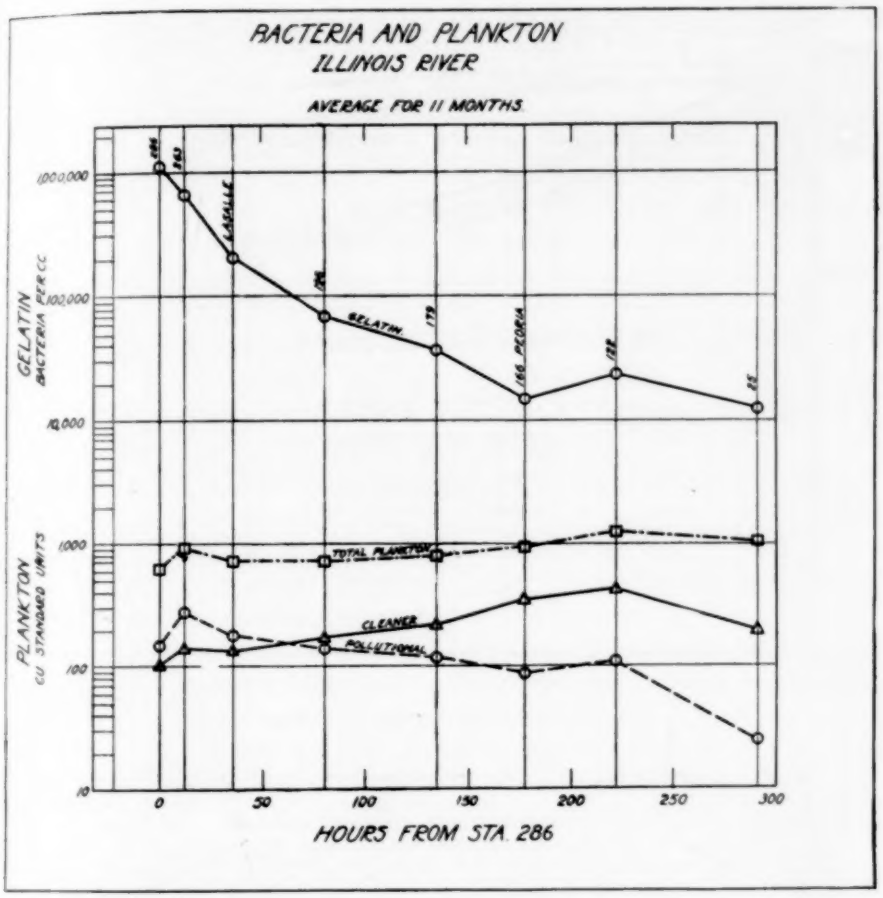
AS a rule, plankton and related organisms are most abundant in water which is in process of recovery from pollution by sewage, that is, during the period of natural purification. Hence we may inquire, (1) Are the activities of these organisms a part of the program of natural purification? (2) What effects, if any, are produced on the water by the presence and activities of these minute forms of life? and (3) What are some of the activities?

Biologically speaking, these microscopic organisms are low in the scale of life, have little differentiation, and relatively few activities, these being concerned chiefly with obtaining food and reproduction of species. From the standpoint of effect upon the water, the matter of food supply would seem to be dominant, and this may be discussed with advantage under the subheads—(1) plankton food, (2) photosynthesis, and (3) expenditure of plankton energy.

Some years ago a noted German investigator, Dr. Marsson, classified all plankton organisms as "food producers" and "food consumers," including in the latter class those organisms which by means of lash, cilia, or other appendage directed a current into their mouth-vacuole or gullet, thereby obtaining minute particles of food, including bacteria. Many other workers both here and abroad have observed and recorded the consistent tendency of certain plankton forms, conveniently designated "pollution organisms," to become numerous when sewage is present and bacterial content is high, and the subsequent decrease or disappearance of these same organisms when bacterial content becomes low. There is abundant presumptive evidence of this sort to the effect that certain plankton organisms necessarily find much of their food in bacteria, not only because of the simultaneous fluctuations of the numbers of the two classes of organisms, but also because of the observed methods of feeding, and the body structure of the plankton organisms as indicated by Dr. Marsson, above quoted. In fact, it would be diffi-

* Read before the Laboratory Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 21, 1927.

CHART I



cult, or impossible perhaps, for the feeding plankton organism to avoid ingesting large numbers of bacteria.

In three rivers thus far studied (Potomac, Ohio and Illinois), these pollutional organisms are most numerous in that part of the stream where pollution is physically evident, and decrease rapidly as the water regains normal condition. Chart I, showing decreasing bacterial content, and decreasing pollutional plankton meantime, is based on Illinois River data, and is, in general, representative of the other streams.

There is, however, quite satisfactory evidence, based on careful laboratory tests, that certain of these pollution organisms are able to consume very large numbers of bacteria, the plankton meantime increasing greatly in numbers. A brief report of these tests was published in 1918.[2] From that report we present herewith Chart IV, and one or two unpublished ones relative to the same tests.

CHART II

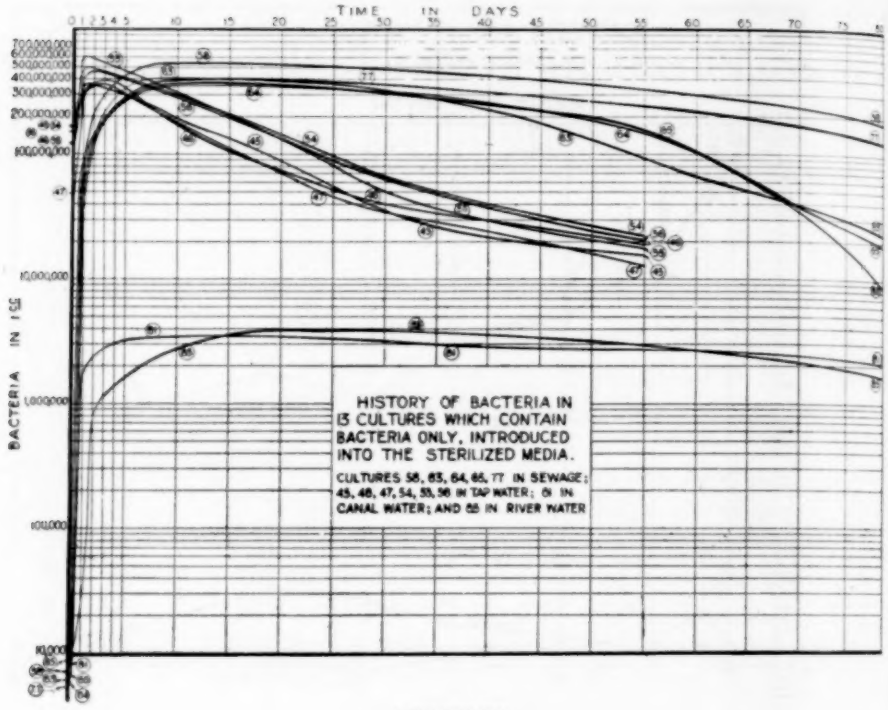
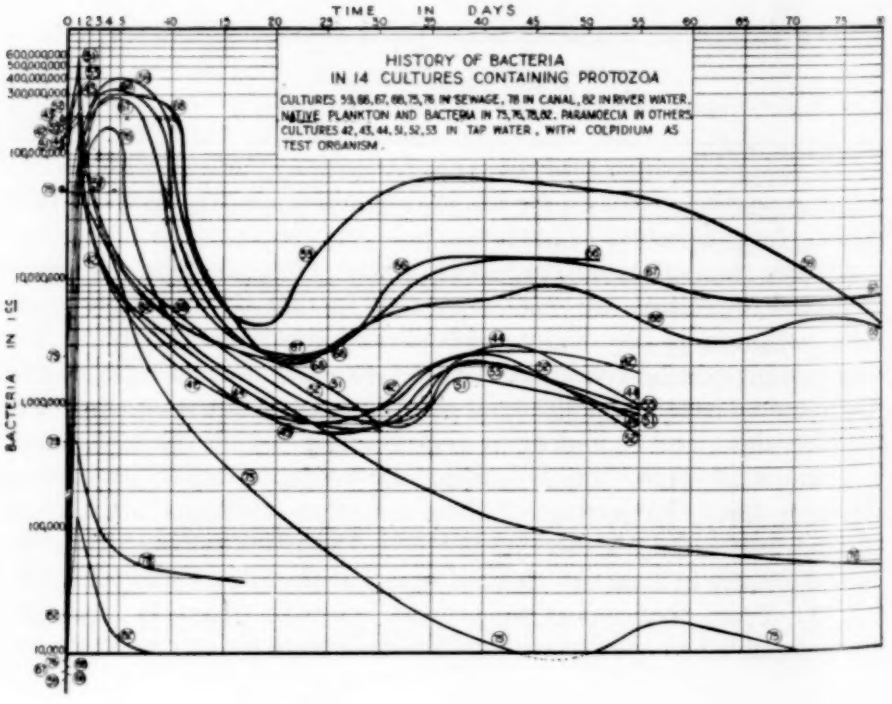

TIME IN DAYS
BACTERIA IN 1 CC
HISTORY OF BACTERIA IN 13 CULTURES WHICH CONTAIN BACTERIA ONLY, INTRODUCED INTO THE STERILIZED MEDIA.
CULTURES 58, 63, 64, 65, 77 IN SEWAGE; 45, 46, 47, 54, 55, 56 IN TAP WATER; 61 IN CANAL WATER; AND 60 IN RIVER WATER

CHART III


TIME IN DAYS
BACTERIA IN 1 CC
HISTORY OF BACTERIA IN 14 CULTURES CONTAINING PROTOZOA
CULTURES 59,66,67,69,75,76 IN SEWAGE, 78 IN CANAL, 82 IN RIVER WATER. NATIVE PLANKTON AND BACTERIA IN 75,76,78,82. PARAMOECIA IN OTHERS. CULTURES 42, 43, 44, 51, 52, 53 IN TAP WATER, WITH COLPIDIUM AS TEST ORGANISM.

Essential results of these tests were as follows,

1. Sterilized sewage, inoculated with bacteria only, reached a very high count in 4 to 6 days and maintained this for 6 to 10 weeks.

2. Sterilized sewage, inoculated with bacteria and also with pollutional protozoa, showed high bacterial maximum in 4 to 6 days, then shortly heavy and rapid reduction, with rapid increase in protozoa about the time of greatest bacterial decrease.

These experiments, repeated many times, always gave essentially the same results, as shown by Charts II and III.

All of the cultures shown in Chart II were of sterilized medium inoculated with bacteria only.

All of the cultures in Chart III were identical with those in Chart II, except for the presence of protozoa in the cultures. It will be noted that the bacterial history is very different. Comparison can best be made by inspection of Chart IV, here shown.

Culture 65 contains bacteria only. The very high content is maintained for about 60 days. Culture 68 is identical except that it contains protozoa, in addition to bacteria. It will be seen that, in this culture, the high bacterial content drops suddenly. It seems significant that the protozoa increase rapidly meantime.

One culture of sterilized sewage was inoculated with bacteria-free protozoa (paramecia). Apparently the minute organic detritus present, and the dissolved materials, did not constitute suitable food, for all the paramecia died within 4 days. After 14 days this same medium, still bacteria-free, was again inoculated with paramecia, but bacteria were added this time. The paramecia multiplied more than a hundredfold under these conditions.

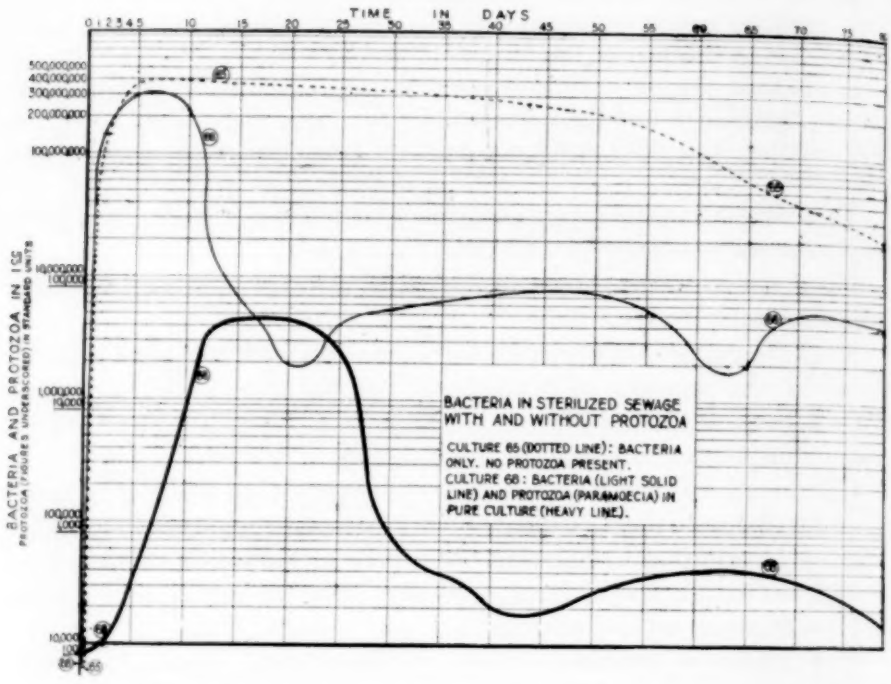
In view of all these results, as stated, it seems difficult to offer any satisfactory explanation other than that the paramecium, a typical pollution organism, consumed bacteria in large numbers. Apparent confirmation of this food habit is indicated by the speedy death of paramecia in the culture which contained no bacteria, and subsequently by the immediate increase of other paramecia in this identical flask of sterile sewage when bacteria were added.

Further laboratory tests indicate that colpidium, another typical pollution organism, is capable of living in a liquid medium (ordinary broth) without bacteria, but it failed to live in sterile sewage without bacteria added. Moreover, it will live in sterile water to which has been added a suspension of bacteria only. These facts indicate the probability that colpidium is in nature a consumer of bacteria, but that life is possible for it with a diet of dissolved organic matter alone, such as

REFERENCE

1. Purdy, W. C. and Butterfield, C. T. The Effect of Plankton upon Bacterial Death Rates, *A. J. P. H.*, VIII, 7:499 (July), 1918.

CHART IV


TIME IN DAYS
BACTERIA AND PROTOZOA IN 1CC
BACTERIA IN STERILIZED SEWAGE WITH AND WITHOUT PROTOZOA
CULTURE 65 (DOTTED LINE): BACTERIA ONLY. NO PROTOZOA PRESENT.
CULTURE 68: BACTERIA (LIGHT SOLID LINE) AND PROTOZOA (PARAMOECIA) IN PURE CULTURE (HEAVY LINE).

broth, provided this be of suitable strength. It has been suggested (by Mr. Butterfield, I believe) that the bacteria are merely the convenient agents to gather or harvest from the water and store within their bodies the highly-diluted soluble organic matter which, in the more concentrated form represented by the resulting bacterial bodies, is suitable food for colpidia and for other protozoa as well.

PHOTOSYNTHESIS

A second major activity of plankton relative to food habits should be mentioned. Reference is made to photosynthesis, by which the chlorophyll-bearing organisms of the plankton, mostly plants, dissociate carbon dioxide and water in the presence of sunlight, and in recombining the elements to form starch, the basis of their nutrition, the excess oxygen is given off as a waste product. Unless the water is already saturated, this oxygen will be dissolved to some extent and may be utilized, if needed, in the aerobic decomposition of organic matter.

Beyond the brief statement of this activity, we have as yet no experimental data to offer. We may state, however, that even in such a polluted stream as the Illinois River the major part of the plankton, volume for volume, is of the chlorophyll-bearing, oxygen-producing sort, and we venture the opinion that adequate study of this unique

activity of the plankton may result in a high rating as to its significance in the program of natural purification.

EXPENDITURE OF ENERGY

1. *Locomotion*—Under the microscope, the plankton activity that is most apparent is that of physical movement. Ciliates scurry to and fro apparently at breakneck speed. Flagellates glide slowly, pulled by their one or two rotating flagella extending a body-length ahead. Oxytricha and its kind move forward, suddenly go in reverse for half a body-length, change direction and again go forward, and so on indefinitely, pursuing a most erratic course. Rotifers start their "wheels" and are thereby pulled through the water as an airplane is pulled by its propeller. Nematodes produce a series of minute maelstroms by their violent contortions, and cyclops, speediest swimmer of the plankton, together with certain other crustacea, travel by a series of leaps or jumps that have given them their popular name of "water fleas."

While the apparent speed of these minute forms is great, the actual speed is very low. A colpidium will cover nearly 1 millimeter per second, a paramecium 3 millimeters, a rotifer 2. But consideration of the *relative* speed shows that the colpidium, 50 microns long, is traveling about 20 times its own length in 1 second, the paramecium 12 times its length, the rotifer 5 or 6 times. A cyclops, hurling its sturdy body through the water 70 or 80 millimeters per second and covering about 100 times its own length meantime, holds the palm. Such relative speeds are impossible for our best motor boats.

But water, being mobile and noncompressible, is locally disturbed and displaced by the movement of a submerged body. In the case of the plankton, the submerged body is self-propelled by its lashing the water with numerous minute cilia, like microscopic oars, or by the rotary movement of flagella, simulating propellers, or by the powerful strokes of paired lateral swimming organs. The disturbance of water thus produced extends far beyond the limits of the body causing the disturbance, as the oars and propeller of a boat produce currents and eddies a boat's length or more away. A paramecium will thus cause minute but violent agitation of the surrounding water to a distance of 100 microns or more on all sides. If 50 paramecia are present in 1 cubic centimeter of water, these will, in about two minutes, subject every particle of this water to this minute and intimate mixing. In like manner, 100 colpidia will, in 22 minutes, minutely mix every portion of 1 cubic centimeter of water. Polluted water usually contains various other motile forms also, some nearly or quite as large as paramecium, others exceedingly minute, but very numerous and usually very active.

2. *Movement of attached organisms*—There are also other organisms, not free-swimming, but attached to any convenient anchorage, at the water's surface, on the bottom, at the margins, or even on small masses of suspended matter. Such organisms, usually in groups or colonies, are mainly of the vorticella type. On the open end of their bell-shaped bodies are rows of cilia in practically constant motion, bringing to each organism a minute but continuous current of water. These colonial forms are amazingly abundant in a sewage polluted stream, forming a whitish feathery coating on bottom stones or trailing from any available submerged attachment. One cubic centimeter of this whitish growth may contain over 200,000 of these minute bell-shaped organisms, and every one of these is engaged in producing the continuous microscopic water current referred to.

The sum total of the minute mixing which these various plankton organisms impose upon the polluted water must be sufficiently great to merit consideration. It is frequently the case that there are present more than 50 paramecia and 100 colpidia per cubic centimeter. But if only these be present, their movements will cause minute, intimate mixing of 1 cubic centimeter of water in one and three-fourths minutes. This being the case, it is surely a conservative estimate to credit the total population of microscopic protozoa of polluted water with complete and intimate mixture of 1 cubic centimeter of water in 1 minute. The process might be conveniently and adequately indicated by the aphorism, "Minute mixing each minute."

Effects—What is the probable effect of such minute continuous mixing and microscopic circulation thus imposed on polluted water during the period of its greatest pollution? We can only say, in the absence of experimental data, which so far as we are aware have not yet been obtained or even attempted by any one, that human experience from time immemorial and in many lines attests the great value—the absolute necessity—of thorough and intimate mixing of ingredients if proper results are to be obtained within reasonable time. In more recent years, the activated sludge process has furnished a striking example of this. It therefore seems reasonable to suppose that this microscopic circulation and minute mixing caused by plankton movements during the critical initial stages of natural purification of polluted water may be a factor of importance in the successful and speedy progress of such purification. In our laboratory, cultures of sewage, containing bacteria only, retained their foul odor and their milky turbidity for 8 weeks or more, while like cultures, which however contained actively motile plankton organisms in addition to bacteria, lost their turbidity and their foul odor in about 10 days. It is possible that

the continuous movements of the plankton organisms were a factor in the latter case. More specifically, we may indicate one result which appears to come from this plankton activity.

These organisms find their food in the polluted water, for they live and multiply therein. As the water slowly regains normal condition apparently this food slowly disappears also, for the organisms lose their plumpness, become thin, then gradually disappear. Apparently the organic matter that constitutes the *pollution* of the water constitutes also, to a great extent, the direct or indirect food of certain plankton organisms that are then numerous. Thus a portion of this polluting organic matter of the water reappears as a multitude of minute living organisms whose rapid and continuous movements represent the *energy* of the organic food they have consumed. In other words, a portion of the harmful organic matter is consumed, then released to the water in terms of motion. Latent energy in harmful organic form has now become kinetic and harmless, and is made to do work concerned with the betterment of the water itself. Correlation of energy is effected, and the polluted water is started on the road to recovery.

3. *Movement of larger organisms*—Certain larger organisms attack masses of organic matter or work in the bottom sediments. *Cypris,* a plankton crustacean, works the surface of sediment over and over until this is reduced to a state of microscopic fineness. The naiid worm *Dero,* occasionally found in the plankton, is frequently very abundant in heavy surface films, where it attacks and burrows into masses of organic matter, apparently eating almost continuously, judging from the great frequency and relatively large amount of its fecal excretions meantime. *Limnodrilus,* an oligochaete worm which does not belong to the plankton proper, delves in rank bottom sediments and works these over, excavating beneath the mud surface and depositing this material on the sediment surface in the form of great numbers of fecal pellets dropped from the anal end waving to and fro meantime in the overlying water. Certain other organisms also help to reduce these larger masses of organic matter or of sediment, but the three just mentioned are outstanding in their activity.

SUMMARY

It is our opinion that the activities of plankton and related organisms constitute a part of the program of natural purification of polluted water, in that their food habits tend to remove a portion of the organic matter, the photosynthetic activities of chlorophyll-bearing organisms operate to produce oxygen, and the energy of harmful organic matter consumed as food and released to the water in terms of motion, serves to furnish an intimate mixing and microscopic circulation during the critical initial stages of recovery from pollution.

The Residual Germicidal Action of Water Treated with Ultra-Violet Light*

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THE WORK of Steenbock [1] and his associates, of Hess [2] and his coworkers, and of others, has demonstrated that fats and oils and certain lipoidal substances can be activated for the prevention of rickets by exposure to ultra-violet light. If the light rays absorbed and then slowly emitted are responsible for this antirachitic activity, it is not unreasonable to expect that such irradiated materials might also exert a germicidal action. Such a possibility was suggested many years ago and denied by Cernovodeanu and Henri [3] in 1910. The question was again raised in 1921 by Walker and Pryer.[4] They concluded that water after exposure to an ultra-violet lamp retained some germicidal activity which was sufficient to destroy a certain percentage of added bacteria, and that this property was dependent upon the amount of electrical energy consumed by the ultra-violet lamp. I have been unable to find any further published material bearing on these claims, except a statement in an article by Coblentz [5] to the effect that ultra-violet light of high intensities affected nutrient agar so as to cause a "considerable mortality" among *Bact. coli* with which the agar plate was inoculated.

In view of the fact that the claims made by Walker and Pryer have not been generally accepted in spite of the somewhat striking experimental data obtained by them, it seemed desirable to reinvestigate this supposed residual germicidal action and, if positive results were obtained, to study the factors involved, particularly in relation to the composition of the exposed water.

Our first experiments were made with Chicago tap water. This is a water of moderate mineral content and with relatively small contamination from sewage or trade wastes. Before entering the ultra-violet ray machine the water was passed through a bone black filter to remove any traces of chlorine. The samples used for our experiments were tested, as a matter of routine, for chlorine with ortho-tolidin. All tests

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-sixth Annual Meeting at Cincinnati, O., October 19, 1927.

were negative. Two commercial ultra-violet light sterilizers were used. One operated on a 110 volt electric circuit. The actual voltages across the lamp during operation varied from 70 to 75 volts. The current was maintained at 4 amperes. The energy consumed was between 280 and 300 watts. The capacity of the machine was about 350 gallons per hour. This same machine was also used with a lamp operated at 80, 90 and 120 volts and 5 amperes, giving wattages from 400 to 600. The other machine was operated on a 220 volt circuit and had a capacity of 1,500 gallons per hour. Our pressure was not sufficient to maintain such a rate of flow. The actual rates during operation varied between 300 and 360 gallons. This should be noted in connection with the interpretation of our results, since the time of exposure of the water to the lamp was much longer than that for which the sterilizer was designed. The voltage across the lamp during operation was 170 and the amperage varied between 4 and 4.5, giving wattages from 680 to 765. A few experiments were made with a lamp which was operated at 200 volts and from 4 to 8 amperes. The energy consumed varied in different experiments from 800 to 1600 watts.

Most of our experiments were made with a Rawlings strain of *Bact. typhosum*. Some tests were also made with a strain of *Staph. aureus* and a few with a culture of Friedländer's bacillus. The number of bacteria was determined by nutrient agar plate counts.

The method of procedure to study any possible residual germicidal action was as follows: The machine was started and allowed to operate for 2 to 4 hours before samples were collected. For each test two samples were taken—one immediately before the water entered the sterilizer and the other as the water left the machine. The samples were collected in sterile glass stoppered bottles. Both the control and test specimens were inoculated with organisms from a 24-hour broth culture after being centrifugated and washed three times with sterile saline. The numbers of organisms added per cc. of sample varied from 150 to 5,250. Agar plate counts were made immediately after inoculation and again after 30 minutes. In some cases counts were also made after 1 and 2 hours. Colonies were counted after 24 hours' incubation at 37°C.

Thirty experiments were made. Except in two instances there was a decrease in the colony count both in the control and sterilized specimens during the first half hour after inoculation. This decrease was not greater in the sterilized than in the control samples. Samples of each kept for 24 hours showed enormous increase in bacterial count.

Our conclusions are based on a comparison of the agar counts from the inoculated sterilized water with those from the inoculated untreated

water, both immediately after inoculation and after the inoculated samples had stood for one half hour. *Bact. typhosum* was used as the test organism. Water sterilized with the 110 volt lamp with an energy consumption of about 300 watts showed no evidence of any residual germicidal activity. When 400 to 600 watts were being consumed, we were able to recover from the irradiated specimens about 40 per cent less bacteria than from the controls. With the 220 volt lamp, consuming about 700 watts, we recovered 28.5 per cent less bacteria from the sterilized than from the untreated specimens. With energy consumption between 800 and 1600 watts this percentage was 42. It is difficult to explain these results on any other basis than that of a residual germicidal action in the irradiated water. The counts were consistently lower with the treated water, although the differences were not constant in different experiments. We were never able to kill all the bacteria added to irradiated water even when the number of organisms used was as low as 100 per c.c. No indication of a residual germicidal action was obtained on samples which were allowed to stand for one hour after sterilization and before inoculation.

When *Staph. aureus* was used in place of *Bact. typhosum* we were unable to find any evidence of residual germicidal action. A few experiments using a strain of the Friedländer bacillus gave results similar to those obtained with the typhoid bacillus.

These results indicate that water after exposure to ultra-violet light of sufficient intensity may show some germicidal activity. We were anxious, however, to make a further study to determine more definitely the factors concerned. While our experimental work is incomplete, we should like to present the results obtained to date.*

Various solutions were exposed in 100 c.c. amounts in 8 inch Petri dishes, to a 220 volt mercury vapor lamp. The actual voltage across the lamp was 150 and the amperage was 3. During exposure the solutions were kept cool by a coil through which cold water was circulating and which served to support the Petri dish. The temperature in the exposed solution never rose above 40°C. The time of exposure was varied but the results obtained after long irradiation (i.e. 30 minutes) were no different from those after 2 or 5 minutes exposure. Immediately after irradiation the solutions and unexposed controls were inoculated with a washed 24 hour broth culture of *Bact. typhosum,* (Rawlings strain). After shaking to obtain as even as possible a distribution of bacteria, a 1 c.c. portion was removed and used to seed a nutrient agar plate. Fifteen minutes later a second portion was removed. Colony counts on the agar plates were made after 24 hours' incubation at 37°C. All

* October, 1927.

solutions were made from sterile distilled water and sterilized in the autoclave before being used.

Experiments were made with the following: distilled water (pH 6.6), NaOH (pH 7.2, 7.8, 8.0), H_2SO_4, (pH 4.2-5.4), Na_2HPO_4. 12 H_2O (pH 7.8-8.6), 0.1 per cent Na_2SO_4, 0.1 per cent $MgSO_4$, 0.001 per cent phenol, 1 per cent peptone, and 0.35 per cent beef extract. In no instance were we able to detect any evidence of a residual germicidal action.

We next added a culture of *Bact. typhosum* to distilled water, sterilized the suspension in an autoclave and irradiated. No residual germicidal effect was noted. Suspensions of the bacteria were then made in sterile distilled water and in sterile 0.8 per cent saline and immediately irradiated. An exposure of two minutes was sufficient to kill all the bacteria even when a suspension of noticeable turbidity was used. Longer exposures were also used. The irradiated suspensions were then tested for germicidal activity. It is possible to interpret the data from these experiments as indicative of the presence of germicidal activity but the number of experiments so far completed is insufficient to warrant a definite statement at the present time.

Attempts have also been made to detect some germicidal action of irradiated cholesterol but have not yet been successful.

CONCLUSIONS

Water exposed to ultra-violet light may retain a slight germicidal power which can be detected under certain conditions.

This activity was detected with *Bact. typhosum* and with Friedländer's bacillus but not with *Staph. aureus*.

A limited series of salt solutions was irradiated but no residual action was noted.

Phenol, peptone and meat extract also give negative results.

Bacterial cells killed by exposure to ultra-violet light appeared to exhibit a residual germicidal action but our data are too meagre to warrant any definite statements. Further work on this action is being carried on.

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1. Steenbock and Daniels. *J. A. M. A.*, 84:1093, 1925.
2. Hess and Windaus. *Proc. Soc. Exper. Biol. & Med.* 34: 171, 1926.
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4. Walker and Pryer. *A. J. P. H.*, 11:403, 1921.
5. Coblentz, *Sci. Papers, Bureau of Standards, No. 495*, 19:663, 1924.

NOTE—The author acknowledges his indebtedness to Miss Katherine Cox and Miss Mary Vrooman for the experimental results on which this report is based.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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NEW YORK LEADS THE WAY

THE news that Mayor Walker has approved the creation of a Bureau of Nursing in the New York City Health Department, bringing all of the 535 nurses employed in the field and in clinics under one director, is very significant in the administration of public health nursing.

In the book, *Community Health Organization*,[1] which was the culmination of the revised plans for health department administration, the following recommendation is made in relation to bureaus of nursing in big city health departments:

> It is considered essential to the highest efficiency that all the nursing work of the department of health should be organized in a separate bureau and under the direction of a chief who is, herself, a nurse. For the administration of such a large organization as is here provided for, a woman of experience and high natural capacity will be needed, and the salary should be commensurate with those paid to other more responsible bureau chiefs.

It is very gratifying that Amelia H. Grant, R.N., who has had a distinguished career in public health nursing and is recognized as one of the foremost public health nurses in America, has been appointed as Director of the newly created Bureau of Nursing. Her appointment is in accordance with the above suggestion and the best public health procedure of the day.

With the increasing trend of public health nursing from unofficial to official agencies, it is exceedingly important that official agencies consider the best possible means of effective public health nursing within their own organizations.

New York has led the way, and it is to be hoped that other communities will consider seriously the recommendations of *Community Health Organization*, so that they too may develop the best possible administration not only in nursing but in all their divisions.

REFERENCE

1. *Community Health Organization*, Edited by Ira V. Hiscock, American Health Congress Series, Vol. II, Part V, American Public Health Association, 1927, p. 42.

THE RETIREMENT OF SIR DAWSON WILLIAMS

THE retirement of Sir Dawson Williams as editor of the *British Medical Journal* is a matter of international importance to the medical world. He has served as editor of this great journal for thirty years, and prior to that, had been connected with the editorial department for seventeen years. In other words, for nearly one-half century, his talents and time have been devoted to the service of the medical profession and the advancement of scientific medicine.

We believe the English appreciate this type of work more than Americans. With few exceptions, the tenure of office in this country is comparatively short and uncertain, though there are few professions which require one to keep so constantly abreast of the times and in closer touch with scientific advancement than the editorship of a scientific journal. Not only must one keep abreast of advances, but he must be on guard constantly against pseudo-science as put forward by the faker on the one hand, or the ill-balanced medical enthusiast on the other.

Sir Dawson Williams was the recipient of many honors from scientific bodies as well as from the Crown, and the British Medical Association awarded him its highest honor—the gold medal of merit.

During his term of service, he has maintained the highest standards of the medical profession and has gained distinction as a journalist. We believe that there is no better medical journal in the world than that to which he has devoted the greater part of his life, and of which he was the guiding genius for so many years. We acknowledge our debt to him.

* Since the above editorial was set, we have been advised of the death of Sir Dawson Williams on February 27.

THE MEASUREMENT OF SCHOOL HEALTH PROGRAMS

THE American Child Health Association is engaged in a research study the aim of which is to find out just how successful the public schools of the country have been in promoting the health of their pupils. In other words, it is a study of the effectiveness of school health programs.* This is a research study rather than a survey. A survey tells what is being done and how it is being done. This research seeks the results from what is being done.

The crux of this study is thus measurement—of what is done in the schools, and of the health of the pupils. To a health problem have been applied the principles of educational measurement. It is from the correlation of these two factors, activity and result, that the association

* See September, November and January issues of *Child Health Bulletin*, American Child Health Association.

hopes to find important clues to effective and ineffective school health activities, allowances of course being made for differing external conditions, such as home environment.

Needless to say, the outcome of this study will be watched with the greatest interest. There is nothing so important as the basing of health work, in school and at large, on clear cut evidence of its value—not merely opinions but indisputable factual evidence. Of course, this is a difficult thing to do. Otherwise we should have far more substantial foundations for many health practices than we now have. Public health practice frequently starts from a laboratory discovery of cause and effect. With this premise there is formed a plan for the social application of this knowledge. It is at this point that so many difficulties are encountered. There is a scientific basis for the use of toxin-antitoxin as a protection against diphtheria. Yet, though lessened, diphtheria continues because humanity cannot be induced to apply this knowledge in a thoroughgoing manner.

Even more difficult than the protection against diphtheria is the successful transmission to the public of a general knowledge of hygiene. Here the matter becomes involved with principles of education, psychology and economics.

Now that we have succeeded in eliminating many of those causes of sickness which were open to attack by collective or community action, such as the prevention of typhoid by water purification, and the prevention of malaria by draining away water which favored the propagation of the malaria bearing mosquitoes, the remaining health problems are largely matters of instructing people in personal habits and conduct. The methods of imparting this instruction are of utmost importance. Our only safeguard against ineffectual methods is through frequent checking or measuring of results.

As we all know, school health work has expanded widely during the last twenty years. It is now almost a universal practice for schools to have physical examinations or inspections, nursing service, health teaching, and physical training. The usual reports of the number of examinations, the number of nursing visits, and the number of teeth cleaned, are of interest in illustrating the volume of effort expended.

The great questions which we should all like to have answered, however, are these:

Is the school child who has received this attention within the school, other influences being equal or equalized, a healthier child as a result of this effort?

What particular health activities bring desired results? Does the member of the tooth brush drill class give evidence of a healthier mouth? Is the recipient of routine school medical inspection and nursing service less encumbered by defects? Does the

recipient of a well formulated health instruction program have a better working knowledge of health?

These are facts about which we know too little, and yet which we ought to take steps to know with more certainty if we are to keep faith with the public which is supporting health work. If the association succeeds in clarifying our knowledge it will have done a most welcome service.

Among the many meritorious features of this research there is one thing that deserves particular mention, and that is that a year and a half was spent in preparation before the actual gathering of data in the field. Tests were constructed, tried out and standardized before acceptance. This practice of thorough and considered preparation before launching an extended investigation could well be emulated.

THE CAUSE OF YELLOW FEVER

ANOTHER chapter concerning yellow fever has been written, and the etiology of the disease has at last been cleared of some of its accumulated rubbish. The work of Carlos Finlay and of the Commission under Walter Reed, concerning the agency of the Aëdes aegypti as the carrier, has been abundantly confirmed, and it seems equally certain that the germ of the disease belongs to the class of filterable viruses, which will pass through the V and N grades of Berkefeld filters.

This work has been done under the auspices of the International Health Division of the Rockefeller Foundation on the Gold Coast of West Africa. The title of the preliminary paper [1] does not give a fair idea of the importance of the contribution. The finding of an animal, the Macacus rhesus, which is susceptible to yellow fever, is necessarily a great step forward in the study of the disease, though other facts of equal or greater value, in our opinion, have been proved.

The virus has been carried from monkey to monkey by inoculations of blood or serum 30 times, and by infected mosquitoes 22 times. Mosquitoes fed on infected monkeys on the second or third day of fever invariably acquire the power to transmit the disease. Certain experiments showed that the mosquito remains infective as long as 91 days. Generally the mosquitoes are kept alive easily for the 3 months and are infective as long as they live. It is impractical to carry the virus in monkeys, since it disappears rapidly from the circulating blood, an observation which agrees entirely with that on human beings by the Reed Commission. Many cultures have been made from the blood of infected monkeys in the special media devised for the cultivation of leptospiras, all negative, and so far none have been found in the tissues

of monkeys dead of the disease. We may therefore dismiss the alleged discovery of Noguchi.

It will be remembered that the well-known expert on yellow fever, John Guitéras, never accepted this work, giving two grounds which he considered sufficient for its rejection. The first was that yellow fever did not occur in epidemic form in animals in the tropics, although inoculation with the leptospira was easy, and second that the leptospira was found after the third day, an observation entirely at variance with the proof given by Reed and his associates that the blood of yellow fever patients contained the virus only during the first three days.

The diagnosis of yellow fever, even in its mild forms, seems to be easy by the inoculation of the Macacus rhesus, but of almost greater importance is the fact that 0.1 c. c. of the serum from a convalescent patient protected monkeys against fatal doses of virulent blood as well as against the bite of infected mosquitoes.

Once again intensive investigation has revealed the secrets of one of the most puzzling of all diseases, but another life has been given to this discovery. Dr. Adrian Stokes, head of the Commission, fell a victim to yellow fever, contracted apparently from an infective monkey. One other name must be added to the roll of those heroes who have sacrificed their lives for the good of their fellowmen in the course of medical progress.

REFERENCE

1. *J. A. M. A.*, Jan. 28, 1928.

ASSOCIATION NEWS

CHICAGO MEETING

THE President has appointed Dr. Louis E. Schmidt, Chairman of the Local Committee for the Fifty-Seventh Annual Meeting of the A. P. H. A. Arthur E. Gorman is Secretary of the committee, which is being rapidly completed. Headquarters of the committee have been established in Room 409 of the Hotel Stevens. This office also serves as headquarters for Dr. C. St. Clair Drake, Director of Exhibits. Members of the Association are invited to make full use of the facilities of this office when they are in Chicago.

The Central Program Committee has outlined a program for the Annual Meeting covering 30 sessions of the sections, 7 of them joint sessions. Three special sessions, 2 general sessions, and a banquet are planned in addition. The committee decided to hold the opening General Session on Monday evening, October 15, and begin the section meetings on Tuesday morning. The American Child Health Association, the American Social Hygiene Association and other organizations and committees will hold meetings on Monday. A full program of trips and entertainment is being developed by the Local Committee which is determined to make the Chicago meeting the best the Association has ever held. All meetings will be held in the Hotel Stevens which will be headquarters. Because of the increased attendance which is expected, the Technical Exhibit will be larger than formerly and will include a wider range of interesting displays. A similar extention of the scientific exhibit is planned.

Members who contemplate offering papers at this meeting are urged to communicate without delay with their respective section chairmen, as the programs are rapidly being completed.

RURAL HEALTH EDUCATION

AT the request of the Milbank Memorial Fund the Association has agreed to undertake a share of the direction and organization of a program of health education in connection with the Chautauqua program in about 200 communities in the northeastern United States. A committee has been authorized by the Executive Board to represent the Association in this project, and Dr. S. J. Crumbine has been appointed chairman of this committee. Under its direction data on public health will be assembled for the use of the Chautauqua lecturers who will speak on the importance of personal hygiene and the value of giving generous support to official public health work. The health officers of the states concerned have been invited to meet with the committee to suggest points of emphasis that will be helpful to them in developing the program in their respective states. To assist in this work the Association has secured the temporary services of Dr. Edward T. Devine who will work under the direction of the committee.

WHAT IS PUBLIC HEALTH WORK?

THE first task of the committee authorized to conduct a census of public health workers was to decide on a definition of public health work. It has tentatively adopted the following definition with a series of sub-definitions for public health workers of various types: "For the purpose of this census public health work shall be defined as those activities carried on by an individual himself, or in connection with an organ-

ization, supported either by public or private funds; this work to be directed primarily towards the prevention and control of disease, the promotion of hygiene and the prolongation of life rather than the cure of the already sick individual."

WEST COAST

AN organizing committee for the west has been appointed under the chairmanship of Dr. W. C. Hassler, Health Officer of San Francisco. This committee is considering the possibility of holding a regional meeting of the Association in Portland early in June.

1929 MEETING

IN accordance with the policy adopted last year communications have been sent to health officers and chambers of commerce in all the larger cities in the two districts from which the 1929 Annual Meeting city is to be selected. These are the Southeastern and Midwestern Districts.

POCKET CARDS

AT the request of a number of members pocket membership cards have been prepared and will shortly be sent to all members and Fellows in good standing.

W. F. Walker, D.P.H., field director of the Committee on Administrative Practice will attend the conference on Records and Reports, Asheville, N. C., April 19-21 called by the Child Health Demonstration Committee.

Elizabeth Brezee, formerly statistician for Child Health Demonstration, Fargo, N. D., will be temporarily associated witht the Committee on Administrative Practice, in developing a hospital survey schedule.

NEW MEMBERS

Robert Eaton Andrews, M.D., Chicopee Falls, Mass. (Assoc.)

J. W. Becker, St. Louis, Mo., Executive Secretary, Missouri Tuberculosis Association

Howard H. Bell, M.D., St. Louis, Mo., Tuberculosis Controller

L. C. Billings, Grand Rapids, Mich., Superintendent and Chief Chemist, Filtration Plant

Grover C. Bolin, M.D., Orangeburg, S.C., County Health Officer

R. E. Bower, M.D., Chillicothe, O., County Health Commissioner

Bertrand Brown, New York, N. Y., Assistant Secretary, Milbank Memorial Fund

Flora N. Brown, R.N., Ann Arbor, Mich., Executive Secretary, Washtenaw County Branch, Michigan Tuberculosis Association

Rex Dean Bushong, D.V.M., Raleigh, N. C., Assistant Engineer, Milk Sanitation State Board of Health

Laurence B. Chenoweth, M.D., A.B., Cincinnati, O., Professor of Hygiene, University of Cincinnati

Carrol J. Clements, R.N., Pelzer, S. C., Public Health Nurse in Pelzer Mill Village

John E. Coe, A.B., M.S., Chicago, Ill., Acting Dean, Chicago Medical School

Alonzo Cooper, Cape Breton, N.S., In charge Laboratory Department, New Waterford General Hospital

Andrew J. Crowell, M.D., Charlotte, N.C., President, North Carolina State Board of Health

William R. Davis, A.B., D.D.S., Lansing, Mich. Director, Bureau of Mouth Hygiene, State Department of Health

Francis De Caria, M.D., Bradford, Pa., Tuberculosis Clinic.

F. W. W. Des Barres, B.A., D.D., Sackville, N. B., Librarian, Mount Allison University (Assoc.)

Robert K. Galloway, M.D., Bardwell, Ky., Director, Carlisle Co. Health Department

Jane &. Gilliford, M.D., Pomeroy, O., County Health Commissioner

Benjamin Goldberg, M.D., Chicago, Ill., Member and Secretary, Board of Directors Municipal Tuberculosis Sanitarium

Ivan C. Hall, Ph.D., Denver, Colo., Professor and Head of Department of Bacteriology and Public Health, University of Colorado

Thomas W. Henderson, Washington, Pa., Secretary, Milk Control Officer, Board of Health

Reuben G. Hamilton, M.D., Columbia, S.C., Malariologist, State Board of Health

Montfort Haslam, M.D., Concord, N. H., Health Director, St. Paul's School

Lee Swee Hock, M.S.D.S., Kuching, Sarawak. Borneo, Health Inspector (Assoc.)

Charles P. Hoover, Columbus, O., Superintendent of City Water Filtration Plant

Emma A. Hunt, M.A., Framingham, Mass., Teacher of Physiology and Hygiene, State Normal School.

O'Neill Kane, M.D., Kane, Pa., Health Officer, B & O Lines

Ethel Kersey, R.N., Elizabethtown, Pa., with State Department of Public Health

Harold B. Keyes, M.D., New York, N. Y. (Assoc.)

Edmond Klamke, M.D., Alexandria, La., Director, Rapides Health Unit

Howard W. Koch, B.S., M.S., Pittsburgh, Pa., Bacteriologist, Fisher Scientific Co.

S. A. Lamoureux, M.D., New Bedford, Mass., Member of Board of Health

Carl W. Larson, Chicago, Ill., Director, National Dairy Council

Lila B. Love, M.S., Greensboro, N.C., Teacher of Bacteriology, North Carolina College for Women

Gordon L. McLellan, M.D., San Leandro, Calif., President Board of Health

Clara S. Miller, R.N., Taylorville, Ill. County Tuberculosis Nurse

David Moxon, B.Sc., C.P.H., Indianapolis, Ind., with Indiana Tuberculosis Association

Wilford A. Norris, M.D., Columbia, Mo., City Health Commissioner

Henry D. Peters, B.S. in C.E., Jefferson City, Mo., Assistant Engineer, State Board of Health

Mary E. Pillsbury, B.S., M.A., New York, N. Y., Consultant, Prophylactic Nursing Technic

Gertrude M. A. Priebe, Detroit, Mich., Special Education Open Window Room Department

Edward M. Quinby, D.M.D., Boston, Mass., Lecturer, Dental Hygienist School, Forsyth Dental Infirmary

T. Eben Reeks, M.D., New Britain, Conn., Hospital Superintendent

Jean K. Rich, M.S., Chicago, Ill., Director, Nutritional Education, American Institute of Baking

Rozella L. Robinson, Glendale, Calif., Junior Technician, Los Angeles County Health Department

Lillian Simpson, R.N., Los Angeles, Calif., Chief Nurse, Los Angeles County Health Department

C. N. Sisk, M.D., Raleigh, N. C., Director, Department County Health Work

Ada S. Stokes, Cincinnati, O., Director of Nurses, Babies' Milk Fund Association, Cincinnati General Hospital

Caroline A. Supe, A.B., Ypsilanti, Mich., School Nurse, State Normal College

M. W. Tatlock, Dayton, O., Superintendent Sewage Treatment Works

Alice H. Walker, Detroit, Mich., Director Social Service and Clinic Administration, Harper Hospital

J. W. Weber, M.D., Woodsfield, O., County Health Commissioner

Kathryn Weigel, Los Angeles, Calif., Technician, Los Angeles County Health Department

Marion McN. Wetzel, R.N., Ann Arbor, Mich., Washtenaw County School Nurse

Verna Willis, B.S., M.S., Jefferson City, Mo., Assistant Bacteriologist, State Health Laboratory

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Typhoid Fever Carriers—There are now 155 known typhoid fever carriers in upstate New York exclusive of the 33 who live in state institutions. During the year 1927, 25 newly discovered typhoid fever carriers were added to the list by the New York State Health Department, giving the total mentioned above. These new carriers were responsible for 47 known cases of typhoid fever. Eight of the carriers are male and 17 female, their ages ranging from 21 to 66. One carrier had typhoid fever as long ago as 1871 and 4 of them stated that they had never had typhoid fever. Eleven carriers were removed from the active list during the year. Of these, 4 died, 3 were apparently cured by gall bladder operations, 3 moved outside of New York State, and in 1 the diagnosis was changed.—*Health News*, New York State Department of Health, V, 30, Feb. 20, 1928.

Diphtheria Control in Kansas—A review of the incidence of diphtheria in Kansas shows no downward tendency has been observed until the year 1922. Kinniman gives 6 reasons for this change: (1) The establishment of full-time county health units in the state; (2) culturing of schools and removal of carriers where epidemics occur; (3) medical inspection of school children and correction of remedial defects of the nose and throat; (4) change in the quarantine laws on cases and carriers; (5) education of the public in preventive measures; (6) immunization of children with toxin-antitoxin.

Educational campaigns with respect to the value of using toxin-antitoxin have been extensively carried on with the coöperation of newspapers, insurance companies, and 22 county medical societies. This work is resulting in a lower death rate for 1927 than that for 1926. C. H. Kinniman, Diphtheria Control in Kansas, *Kansas Medical Society J.*, 27:325 (Oct.), 1927.

Diagnosis of Measles—Stimson makes a plea for the individual isolation of every person with measles. He feels that secondary infections at times are almost as contagious as is the primary measles. The features of the period of onset are enumerated chronologically by associating them with the fingers of the outspread hand.

Beginning with the little finger is the first symptom, fever. Twelve hours later comes the ring finger, or puffiness of the lower eyelid, and perhaps the measles line, together with the first sign of the enanthem or rash on the fauces. Twelve hours later or middle finger, come the evidences of catarrh, also known as the three C's; to wit, conjunctivitis, coryza and cough. Twelve hours later, or the forefinger, are found Koplik's spots. Thirty-six hours later, or as far from the forefinger to the thumb as it is from the little finger to the forefinger, comes the rash or exanthem, and for the palm we have a certain amount of headache and a considerable malaise throughout this period.

Stimson describes the so-called measles line, "a fairly definite line of congestion across each lower lid, about at the margin of the tarsal cartilage and perhaps a third of the way from the lid margin to the fornix." The appearance of this line has assisted in making an early diagnosis.—Philip Moen Stimson, The Earlier Diagnosis of Measles, *J. A. M. A.*, 90:660 (Mar. 3), 1928.

Cattaraugus County Demonstration—The County Board of Super-

visors has voted to finance the activities of the County Board of Health for the year 1928 as developed with the aid of the local demonstration being conducted by the Milbank Memorial Fund. During the 5-year period of the demonstration the tuberculosis death rate has been reduced about one-third, while there has been a reduction of nearly one-fifth in the infant mortality rate. Cattaraugus can boast of having established the first county health department and the first county-wide school health unit in New York State. While there have been some objections made to the demonstration program by members of the medical society, it must be said that, on the whole, the physicians have given splendid coöperation in the development of the County Health Department, and have assisted in building up preventive programs in the field of tuberculosis, maternal hygiene, and child welfare.—Edward W. Sheldon, *Milbank Memorial Fund Quarterly Bulletin*, Jan., 1928.

Isolation of Communicable Diseases—The New York City Department of Health has recently distributed new rules for isolation and exclusion of school children in cases of communicable diseases. The small publication in which these regulations appear summarizes a few of the principal signs and symptoms for each communicable disease. There is also an abbreviated statement of the chief source of infection and the mode of transmission. The usual incubation period is stated, and definite rules are enumerated with respect to the duration of exclusion from school for both patient and exposures. The exposures are again subdivided into those having had the disease and those who have not had the disease.

In the case of diphtheria the patient is excluded from school until two successive negative cultures taken not less than 24 hours apart have been obtained from the site of the disease or preferably from the nose and throat, the first of these terminating cultures to be submitted not less than 12 days after the onset of the disease. Exposed persons may return to school 7 days after the last contact with the patient, provided they show a negative culture at the end of the 7-day period. Those who change their addresses must move to a home where there are no children. All exposed persons are urged to receive temporary protection by an injection of antitoxin. Later they should procure permanent protection by immunization with toxin-antitoxin.

In the case of scarlet fever the patient is excluded for a minimum period of 30 days from onset, provided no abnormal discharges are present at the end of that period. Those exposures who have had the disease may return to school provided they move to a home where there are no children, but those exposures who have not had the disease may return to school 7 days after last exposure.

In the case of measles the patient is excluded from school for 7 days after the appearance of the rash, provided no abnormal mucous membrane discharge is present. Those exposures who have had the disease are not excluded if there is sufficient evidence that they have actually had measles, and if they move to a new address where there are no children. Those who have not had measles may return to school 14 days after the last exposure.

Other diseases for which rules have been outlined are typhoid fever, smallpox, poliomyelitis, epidemic cerebrospinal meningitis, whooping cough, german measles, mumps, chicken pox, and tuberculosis.—Louis I. Harris, Commissioner, New York City Department of Health.

Trachoma Prevention Program—The first organized trachoma prevention work of the U. S. Public Health Service was undertaken in Kentucky in 1912.

In 1913 and 1914 this work was extended to 23 counties in that state, involving an examination of over 18,000 people. A plan was evolved for the establishment of small hospitals to serve as dispensaries and clinic centers, and headquarters for surveys and educational work. The first hospitals were established in Kentucky in 1913. The survey work has been extended to West Virginia, Tennessee, Arkansas and Missouri. In the latter state it was found that 20 per cent of blind pensioners who were receiving on the average of $300 each per year from the state were blind as a result of trachoma.

The trachoma prevention program has served as an impetus to the installation of full-time county health departments. The trachoma hospitals have a fourfold function:

1. Clinical treatment of cases
2. Study of the disease itself
3. Education of patients in personal hygiene and disease prevention
4. Centers for field work.

Paul D. Mossman, Trachoma In The State's Health Program, *Pub. Health Rep.*, 43:449 (Feb. 24), 1928.

Codification of Ordinances—Greenman aims to suggest a practical manual of procedure for the codification of ordinances. The author points out the need of a systematic code as a convenience to the courts, the legislature, and the city officials. The material codified should be kept up to date and should consist only of those ordinances and regulations which are being enforced, and those which are either obsolete or which have been nullified by changed conditions should be eliminated. He outlines the administrative code now employed in several cities including Cincinnati, Kansas City, Cleveland, and Toledo, and then proceeds to the establishment of first, a summary outline for a model municipal code, and follows this with a more detailed outline. With regard to the sanitary code the author states:

> Sanitary codes applicable to various sections of the country are more difficult to standardize. They must be developed in conformity with state-wide conditions. Model sanitary codes have been prepared for some states, notably New York and Iowa. The American Public Health Association has a model sanitary code in preparation at the present time. The U. S. Public Health Service has issued bulletins giving municipal ordinance rules and regulations pertaining to public health. These bulletins will often give sanitary regulations on special subjects and are of considerable value where unusual conditions are being regulated.

The model sanitary code contains 7 articles, each one of which has from 2 to 37 subdivisions. The articles are as follows:

1. Communicable diseases
2. Milk and cream
3. Meat and meat products
4. Sanitation
5. Camps
6. Miscellaneous
7. Penalties and general provisions.

The captions of the subdivisions serve to remind one working on a proposed sanitary code of the practices and procedures which should be considered in formulating such code.—E. D. Greenman, Codification of Ordinances, *Publication No. 6*, Municipal Administration Service, 261 Broadway, New York, N. Y., 1928.

LABORATORY

C. C. YOUNG

A SIMPLIFIED PROCEDURE IN DETERMINING B. COLI IN WATER

(PRESUMPTIVE TEST)

WILLIAM LITTERER, PH.C., M.D.

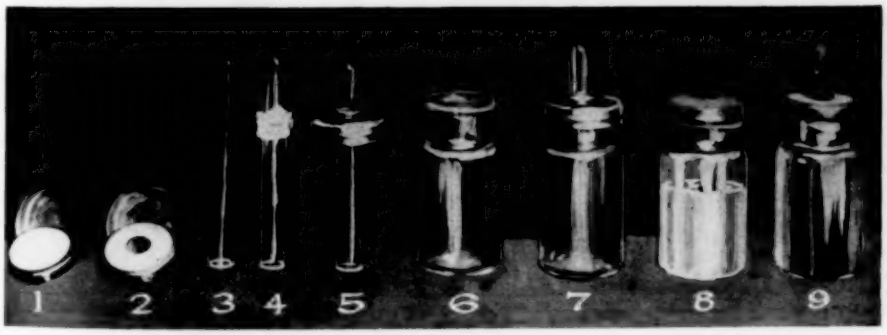
Director of Laboratories, Tennessee State Department of Public Health, Nashville, Tenn.

SIMPLIFICATION of any procedure in determining *B. Coli* in water is manifestly welcomed by bacteriologists provided it does not jeopardize accuracy in attaining results.

This procedure is not only simple but quite inexpensive as compared with the Smith fermentation tube or the Durham inverted tube method in determining the production of gas in the lactose broth medium.

This method has been used by the Tennessee State Department of Public Health Laboratories for a number of years with a few modifications each year until at the present time the following procedure is being carried out.

Instead of using the Smith fermentation tube or the Durham tube we simply employ an ordinary specimen bottle, capacity 50 c.c.; outside diameter at the base 4.3 cm.; outside diameter at the mouth with lip 4 cm.; heighth 8 cm. Into this specimen bottle a test tube is inverted, capacity 10 c.c., length 10 cm.; outside diameter 1 cm. A tin salve box (lacquered) which is ordinarily used in mailing samples of feces, is used for a covering or top to fit over the mouth of the bottle (either the top or bottom



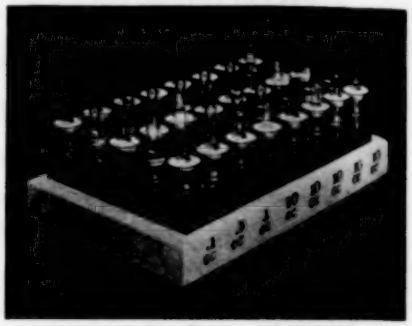
Five samples of water can be tested in this compact space

1. *Lacquered tin box opened*
2. *Holes cut into center of top and bottom of box*
3. *Test tube*
4. *Test tube with cotton string*
5. *Test tube pushed into hole of tin top with cotton string on under surface*
6. *Fermentation bottle*
7. *Test tube with attached tin top placed into bottle*
8. *Fermentation bottle with test tube filled with lactose bouillon*
9. *Fermentation bottle and tube indicating fermentation*

of the box can be used). This tin box should have an inside diameter slightly greater than the outside diameter of the mouth of the bottle so as to fit loosely over its mouth. The tin top should have a hole cut into its center so that the test tube will fit snugly when pushed into it. The diameter of the hole should be about the same as the outside diameter of the test tube. It is necessary to make the joint fit securely to prevent outside contamination. This is accomplished by wrapping a cotton string (wet) 2 or 3 times around the test tube at a point on a level with the mouth of the bottle. Then the tin box is pushed down over this which acts as a washer. It will fit securely especially after sterilization which causes the cotton string to contract thereby making a perfect joint. The cotton string serves to hold securely the tin top to the test tube and at the same time to prevent outside contamination. Quite recently we have used an improvised method of fixing the top to the test tube; viz: by soldering a small galvanized iron ring, 1 cm. on the under surface of the tin box. The ring should have sufficient diameter to allow the cotton string to act as a bushing. This soldered ring on the under surface of the tin box serves to fit the test tube in a definite position and affords a better bushing with the cotton string. However, the other method is practically as satisfactory. The tin top overhangs the mouth of the bottle about 1 cm. which also prevents dust particles and bacteria from gaining entrance to the bottle.

This simple apparatus, above described, is now ready for use. About 30 c.c. to 35 c.c. of lactose broth is introduced and sterilized on 3 successive days or by autoclave 15 lbs. not to exceed 20 minutes. Such sterilization will dispel all of the air in the inverted test tube leaving no bubbles in the upper part. Such an apparatus, which we may term as a "fermentation bottle," is quite inexpensive only costing about 5 cents. It is easy to clean and to refill, not apt to break—will set on its own base and there is no cotton to contend with.

Another great advantage is the rapidity with which water can be inoculated in this "fermentation bottle." For



Tray holding forty sterile "fermentation bottles" filled with lactose broth ready to be tested.

example, if 10 c.c. of a given water is desired to be inoculated into a "fermentation bottle," just simply raise or tilt, with the left hand, the test tube attached to the tin box and with the right hand introduce the 10 c.c. of water by means of a 10 c.c. pipette. Many samples can in this way be inoculated in a very short space of time.

SPECIAL TRAY

Another advantage is the great saving of incubator space especially where a large number of samples of water is to be examined, viz: by the use of a "special tray" which we have devised for the purpose. This tray is designed to fit the average regulation incubator. It is sufficiently large to hold 10 samples of water. These trays can be placed upon each other so that 20 or even 30 samples of water can be tested for fermentation in any regulation small incubator.

The tray can be made by a carpenter at a very small cost. The following are the dimensions of a tray that will hold enough "fermentation bottles" to analyze at one time 10 samples of water. We

use 8 "fermentation bottles" as a routine for each sample of water for example:

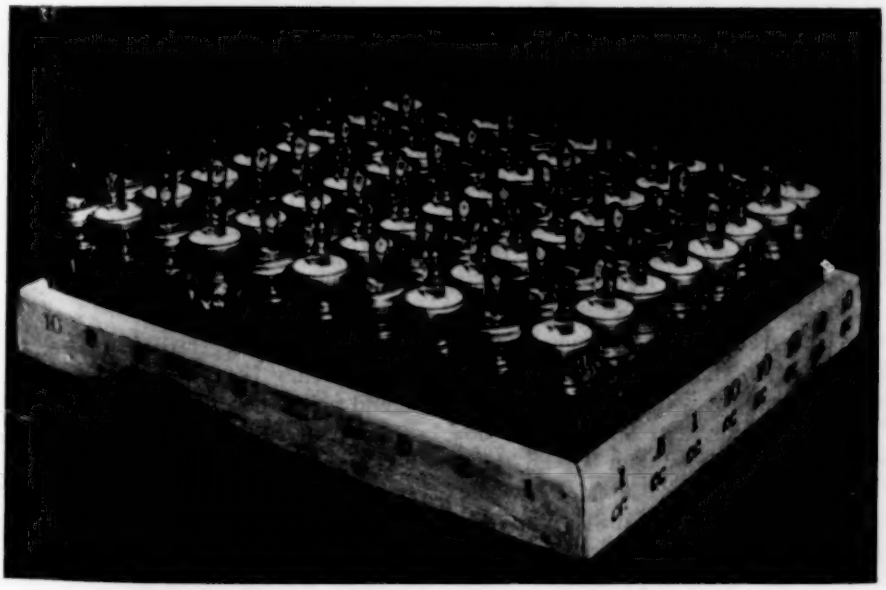
5 bottles containing 10 c.c. of the water
1 " " 1 c.c. " " "
1 " " 1/2 c.c. " " "
1 " " 1/10 c.c. " " " .

Therefore for 10 samples of water there will be 80 "fermentation bottles."

The tray is made of poplar wood about 2 cm. thick. It is 43 cm. long, inside dimension, and 34 cm. wide, inside dimension. The border or flange of the tray should be raised about 2.5 cm.

On the outside of the tray are the following numbers printed on the flange of the long portion 43 cm., viz: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10; This indicates the number of samples of water to be tested. Now on the wide or short side of the tray, i.e. 34 cm. is printed 0.1 c.c. —0.5 c.c. —0.1 c.c. —10 c.c. —10 c.c. —10 c.c. —10 c.c. —10 c.c. —10 c.c. This indicates the amount of water inoculated into the "fermentation bottles." If you prefer to change the figures as to the quantity of water introduced into the "fermentation bottles" you may do so according to your preference. We simply use this amount as our routine examination of all samples of water where we have a reasonable check on said waters. However, on totally unknown waters we employ a greater dilution in addition to the above scheme outlined.

The tray containing 80 bottles (10 samples of water) can now be easily handled and placed into any regulation incubator. At the end of 24 hours it can be removed and fermentation noted. If any of the tubes show fermentation then a sterile platinum loop is thrust into the "fermentation bottle" by simply lifting and tilting the test tube and attached tin top. No cotton to worry with or flaming the mouth is necessary. No removal or handling of the "fermentation bottle" from its original position. It is not necessary to remove the bottle from the tray. The tray is now placed back into the incubator for another 24 hours and at the expiration of 48 hours a final reading of the various fermenting tubes is re-



Tray holding eighty sterile "fermentation bottles" filled with lactose broth ready to be tested. Ten samples of water can be tested in this compact space.

corded or subsequently inoculated on Endo media, etc., etc., for final determination of *B. Coli*. The suspicious colonies isolated on Endo or litmus lactose agar or E. M. B. media can now be inoculated into a sterile "fermentation bottle" containing lactose broth or other sugars if necessary.

If a tray is wanted to hold enough for the examination of 5 samples of water or in other words to hold 40 "fermentation bottles," the following inside dimensions are recommended, viz: 34 cm. long, and 22 cm. wide, with a flange about 2.5 cm. from inside.

WATER ANALYSIS IN THE FIELD

The use of the "special tray" for 5 samples of water holding 40 sterile "fermentation bottles" filled with lactose broth renders possible the inoculation of water samples in the field. An ordinary hand valise will hold 2 of these trays, i.e. enough material for the examination of 10 samples of water. Owing to its compactness there is no danger of spilling the media unless the valise be actually up-ended. The sterile pipettes can also be placed in the valise hence making the outfit complete. The inoculated samples can now be taken to the nearest incubator for future observation.

CONCLUSION

The foregoing outlined procedure is practical and accurate, at the same time inexpensive and time saving. It should appeal to all laboratories especially to state laboratories where a large number of samples of water is daily examined.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

A New Health Record in American and Canadian Industrial Populations—In no previous year were health conditions among the industrial populations of the United States and Canada as satisfactory as during 1927.

The death rate among the wage-earners of the two countries, and their dependents, may be accurately gauged by that of the more than 18 million of them who are industrial policyholders of the Metropolitan Life Insurance Company. This rate dropped, in 1927, to the amazingly low figure of 8.4 per 1,000, which is a new minimum for all time. The year 1926 is the latest for which comparable mortality data for the general population are available. From 1911 to 1926 the general population death rate for persons in the age range which is comparable with that of the Metropolitan industrial experience (that is 1 to 74 years, inclusive) declined only 11.7 per cent. But among the insured wage-earners, their wives and children, during the same period of years, the death rate dropped 29.3 per cent. The reduction in the death rate has been reflected in a considerable increase in the expectation of life. Among wage-workers and their families the expectation of life in 1926 was 8.39 years longer than the average for the years 1911 and 1912. In the general population the increase was only 4.70 years.

There were very few untoward developments in the public health record of the year. There were, it is true, some unfavorable items, and these are of considerable importance because they pertain to preventable diseases. Early in the year there was a bad outbreak of

typhoid fever in Montreal; and there was unusual prevalence of poliomyelitis in the United States which resulted in an above-average death rate for this disease. The year was also marked by an increase in the prevalence of diphtheria, which was not only quite general over the United States but in various other parts of the world. What has happened with reference to these three diseases has had little effect upon the general death rate because, after all, they are of relatively small importance numerically. More important is the increase in violent deaths.

Beyond question the greatest single public health fact of 1927 was the great reduction in mortality from tuberculosis to a new minimum for all time. The death rate from tuberculosis of the respiratory system which causes almost nine-tenths of all the deaths from tuberculous disease, has dropped 59.3 per cent since 1911. While the mortality from diphtheria increased slightly last year there was marked improvement with respect to measles, scarlet fever, and whooping cough. No other single item contributed so much to the establishment of a new minimal death rate last year as did the unprecedentedly low mortality from pneumonia. And never before except in 1919 and 1921 (the years following the great influenza pandemics) has there been as big a year-to-year drop in the pneumonia death rate as was recorded between 1926 and 1927. A drop in the mortality from influenza was an important factor in establishing the new minimum for pneumonia. The facts for cancer in 1927 give no comfort. Although the death rate is only fractionally higher than that for last year it again stands as a new maximum figure for this disease. The diabetes death rate in the industrial population in 1927 was the same as in 1926. The death rates for heart conditions and cerebral hemorrhage dropped slightly last year and that for chronic nephritis declined appreciably. The death rate for puerperal diseases, in 1927, although identical with that recorded in 1926, is the lowest ever registered among women in the American and Canadian industrial populations. The 1927 alcoholism rate was higher than that for any year since 1917 with the exception of 1926. It is lower than for any year between 1911 and 1917 inclusive. There was a slight decline in the death rate, from cirrhosis of the liver, that is, from 6.7 in 1926 to 6.6 in 1927. There is one single item in the fatal accident situation where conditions are going from bad to worse each year. This item is automobile fatalities. The 1927 figure is more than eight times that for 1911, more than three times that for 1915, almost twice that for 1917 and has increased 67.6 per cent in the 7 years since 1920. The 1927 suicide rate was the highest in the industrial population since 1917. The homicide rate showed a slight increase over last year.—Met. Life Ins. Co. *Stat. Bull.*, 9:1-9 (Jan.), 1928.

Vital Statistics of Philadelphia, 1927—The death rate in Philadelphia was 12.2 per 1,000 population, the lowest in the history of the city. The only other year which approached that of last year was 1921, when the general mortality was 12.7. The greatest reductions are in the acute and chronic infectious diseases. A conspicuous feature is the tremendous drop in the mortality from pneumonia and broncho-pneumonia. Last year the total number of deaths from these two causes was 2,361 and a mortality rate of 116.0 per 100,000 population, compared with 3,441 and a mortality rate of 171.4 for the year 1926. The tuberculosis death rate for the year 1927 (85.5 per 100,000 population), as well as the infant mortality (63.8 per 1,000 births), were the lowest in the history of the city.

The common acute infectious diseases showed the lowest mortality on record;

typhoid fever with a death rate of 1.4 per 100,000 population; measles with only 3 deaths and a rate of 0.2; scarlet fever, in spite of its prevalence, registered only 34 deaths and a rate of 1.7; whooping cough with 31 deaths and a rate of 1.5; diphtheria with 220 deaths and a rate of 10.8, which was the lowest on record. There were 1,175 fewer deaths from heart disease last year than in 1926.—Philadelphia Dept. of Public Health. *Monthly Bull.* 13:2, (Jan. & Feb.), 1928.

Vital Statistics of Kenya, British East Africa—The compilation of vital statistics in Kenya is made difficult by the lack of definite information as to the number of natives living in the section and by poor registration of births and deaths.

In Nairobi a census in 1926 showed 2,665 Europeans and 9,199 Indians, Arabs and others while the Africans were estimated at 21,000 making a total of 32,864. The total deaths in 1926 were 745 giving a crude death rate of 22.6 per 1,000 as compared with 12.8 for 1925. The European death rate was 13.5 per 1,000 Europeans, the Asiatics had a rate of 30.3 and the natives 17.3. The chief cause of death was pneumonia which caused 171 deaths in 1926, and 121 in 1925, malaria caused 130 deaths in 1926 and 19 in 1925, plague 32 in 1926 and 4 in 1925, tuberculosis 17 in 1926 and 14 in 1925, dysentery 9 and typhoid fever 4 in 1926.

The population of Mombasa was 40,500 including 676 Europeans. There were 776 deaths in 1926 giving a death rate of 19.5 for the total population and of 13.3 for the Europeans. Pneumonia caused 150 deaths in 1926 and 105 in 1925, pulmonary tuberculosis 69 deaths in 1926 and 67 in 1925, malaria 84 in 1926 and 93 in 1925, diarrhea and dysentery 45 in 1926 and 87 in 1925.

The population of Kisumu in 1926 was 7,656 including 141 Europeans. In the same year there were 191 deaths giving a death rate of 24.9 as compared with 17.9 in 1925 and 1924. The European death rate in 1926 was 21.3. The death rate from respiratory diseases was 850 per 100,000 in both 1925 and 1926, from tuberculosis 50 in 1925 and 90 in 1926, from malaria and blackwater fever 100 in 1925 and 380 in 1926, and from intestinal diseases 200 in 1925 and 340 in 1926.—*Annual Medical Report of the Colony and Protectorate of Kenya*, 1926. p. 9-18.

Health Conditions in Tanganyika—From a report to the League of Nations on the administration of Tanganyika territory for the year 1926, it appears that the European population is now about 4200. The total native population is now estimated as 4,319,000.

The number of European medical officers employed increased from 39 in 1925 to 46 at the end of 1926, the number of Asiatic assistant, senior sub-assistant, and sub-assistant surgeons from 39 to 50, and the number of private doctors registered as medical practitioners in the territory from 8 to 14. These figures do not include the headquarter staff, laboratory staff, entomologist, and dental surgeons.

The incidence of dangerous infectious diseases throughout the territory during 1926 was very low. A total of 20 cases of smallpox was reported from five districts; no deaths occurred. Cerebrospinal fever showed no signs of becoming epidemic; only light cases, with 4 deaths, occurred.

With the exception of 6 fatal cases reported from the remote district of Shirati, an epidemic area situated on the Tanganyika-Kenya border, no cases of plague were reported in the whole of the territory. Influenza, as in previous years, has been responsible for the largest number of deaths—viz., 209—the number of cases is not known.

During the year 6 medical officers have been seconded exclusively for sleeping sickness work. No new foci of infection have been discovered, and the activities of the sleeping sickness staff have been mainly concentrated on the infected areas in the Tabora and Ufipa districts. The policy adopted in this enormous area, approximately 10,000 square miles in extent, has been to concentrate the population in fly-free clearings. The disease shows no sign of becoming endemic, and until the fly can be eliminated, or the inhabitants removed to fly-free areas, sporadic cases will continue to occur.—*Lancet* 2:1219-1220 (Dec. 3,), 1927.

Health of Northern Ireland, 1926—The fifth annual report of the Registrar-General relating to Northern Ireland in 1926 gives the number of inhabitants of Northern Ireland as 1,256,322. The birth rate fell steadily from 1920, with the exception of 1923 and 1926, in which years there were slight recoveries. The death rate has varied considerably; it was high during the war years, and then fell steadily until, in 1923, it reached 14.9. In the following year an epidemic of influenza and a high rate for respiratory diseases resulted in an increase to 16.1, but since then there has been an annual decrease, and the rate of 15.0 for 1926 is the lowest recorded during the past 10 years, with the exception of that registered for 1923. Deaths from tuberculosis continued to decrease, but still represent nearly 10 per cent of the mortality from all causes. In the age period 15 to 25 this disease is responsible for over 54 per cent of deaths, whereas in the following 10-year period the proportion falls to 44 per cent. Deaths from influenza in 1926 totalled 482, being less than half the average for the past 10 years.

Heart disease was the chief cause of death, and is followed by tuberculosis and cancer; the death rate from this last condition has risen each year from 1922 to 1925, but was slightly lower in 1926. There was a slight increase in the mortality due to encephalitis lethargica and cirrhosis of the liver.—*Brit. M. J.* Jan. 7, 1928, p. 29.

Health Conditions in New York State, 1927—The health of the people of the State of New York in 1927 was exceptionally good. The death rate (12.3 per 1,000 population) was never lower and was equalled but once in 43 years. Infant mortality (59 deaths under one year per 1,000 live births) was the lowest recorded since 1904, when these deaths were first compiled separately. The birth rate (19.9) was practically identical with that of 1926.

There was a drop in the death rate from diseases of the heart. We must not, however, ascribe too much significance to this decline because the high death rate in 1926 was directly influenced by the abnormally severe weather during the first months of the year. The present death rate from diseases of the heart, with the single exception of the preceding year, is still greater than ever before. The death rate from pneumonia (107.2 in 1927) declined 28 per cent and the proportion of deaths due to this cause was only 8.7 as compared with 11.1 in 100 deaths last year. The death rate from pneumonia in 1927 was, with one exception, the lowest ever recorded. Cancer, with the highest mortality (124.3) on record, is now second among the causes of death. A year ago it was third, in 1917 it was fifth, and 20 years ago it was eighth. The death rates from nephritis, acute and chronic, 82.7 and from tuberculosis, all forms, 81.9, have never been lower. The decline in the tuberculosis death rate was the greatest recorded in any one year since 1921 and the 1927 rate was one-half of the rate recorded only 10 years ago.

New minimum points were reached by typhoid fever (1.7), measles (1.6),

diarrhea and enteritis under 2 years, (13.1), bronchitis (5.0). The mortality from whooping cough (4.2) was lower only once since 1885. On the other hand, the continued decline in the death rate from diphtheria was broken with an increase from 6.4 to 8.6. The diabetes death rate (24.4) was practically the same as in 1926, which, next to the rate of 1922, was the highest in 20 years. The death rate from automobile accidents (21.2) continued to rise, the suicide rate (16.0) was the highest since 1915, and the rate from homicide (5.0) was higher but once in a score of years. The mortality from alcoholism (8.1) was identical with that of 1926. Cases of diphtheria increased by almost 7,000 as compared with 1926; there was also an increase of more than 200 cases of poliomyelitis, 13,000 cases of scarlet fever, 5,000 cases of chickenpox, and almost 15,000 cases of mumps.—New York State Dept. of Health. *Health News* 5:25-26 (Feb. 13,), 1928.

Vital Statistics of Great Britain, 1927—The British birth rate of 16.7 per 1,000 is the lowest recorded since the establishment of civil registration. The rate in 1926 was 17.8. The death rate was 12.3 which is 0.7 per 1,000 above that of 1926. The infant mortality rate was 69 per 1,000 births which is equal to the 1923 rate, the lowest on record.—*New York Times,* Jan. 20, 1928.

Rheumatic Fever and Heart Disease in London—Recent estimates indicate that from 40 to 50 per cent of the recorded mortality from heart disease is rheumatic in origin. At early ages this proportion is doubtless considerably greater but the studies that have been made fail to show any clear evidence that the mortality from heart disease at any particular age period is especially associated with the prevalence of rheumatism in the different areas. Assuming the rheumatic fever mortality rate to be an approximate index of rheumatic prevalence the local incidence of the disease shows a general tendency to be more common in the areas where the conditions of life are least favorable. There is a closer relationship, however, between unfavorable environment and the mortality from heart disease at the early ages in which the majority of the cases are undoubtedly of rheumatic origin. this correlation appears to be practically equivalent at ages 15-24, 25-44, and 45-64 and is generally more intensive than that between the mortality from rheumatic fever and heart disease at any of the corresponding ages. The mortality from cardiac disease in females seems to be more closely related to environmental conditions than in males but it is difficult to decide whether this is due to the more continuous and prolonged exposure of the female population to the deleterious influences of the unhealthy home.

Previous studies have shown a positive correlation in the county divisions of England and Wales between the rheumatic fever mortality and the general prevalence of damp and cold weather as well as with the mortality from organic heart disease. In London, however, perhaps because of more uniform weather conditions, there is smaller variation in the mortality rate from rheumatic fever and a less definite association with the incidence of heart disease.—Matthew Young. Some Observations on the Mortality from Rheumatic Fever and Heart Disease—*Lancet,* 2:1069-1070. (Nov. 19), 1927.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

STUDIES ON THE USE OF CHLORINE IN SEWAGE TREATMENT

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IN coöperation with the Chlorine Institute and the town of Chapel Hill, N. C., the Division of Sanitary Engineering of the University of North Carolina has begun a series of studies on the use of chlorine in sewage treatment. The university and town are served by two sewage treatment plants. One plant consists of an overloaded Imhoff tank, located at some distance from town and frequently receiving sewage in a septic condition, which provides only screening and plain sedimentation of the strictly domestic sewage, and discharges it into a small stream of low velocity flowing for a distance of more than four miles below the plant before receiving any tributaries. This plant affords ideal conditions for studying the effects of chlorine on foaming, hydrogen sulphide production, disinfection, reduction of biochemical oxygen demand, sludge digestion, and the progressive oxygen demand down-stream. The other treatment plant, of smaller size, is located nearer the town, receives fresh domestic sewage, and consists of a primary Imhoff tank, lath trickling filters, and secondary Imhoff tank discharging its effluent into a small, but rapidly flowing, brook. This plant is suitable for studies of the effects of chlorination on secondary treatment processes.

The scope of the investigation as at present projected may be summarized under the following headings:

1. Correction of foaming in Imhoff tanks
2. Study of chlorine demand of raw sewage and tank effluents under different seasonal conditions
3. Effect on plant operation of chlorination of sewage in long outfall line at various distances above treatment works
4. Hydrogen sulphide control in plants
5. Effect on biochemical oxygen demand of effluents by prechlorination and postchlorination
6. Effects of various degrees of chlorination on progressive oxygen demand in water of stream below plant
7. Disinfection efficiency of various amounts of chlorine applied before and after sedimentation in Imhoff tank
8. Effect of chlorination on sludge digestion as indicated by pH, mineralization, quantity and quality of gas production

Recording devices are provided for measuring the flow of sewage and that of the receiving stream. An injector-type chlorinator, housed in a portable building, can be moved to any desired point of chlorine application. The chlorine and chlorine equipment are furnished by the research division of the Chlorine Institute, while the town of Chapel Hill has built the necessary structures, gaging and sampling stations, and assists in the conduct of the work.

These studies have been in progress since the fall of 1927, and will probably be continued for a period of a year, or longer.

The Effects of Storage Upon the Quality of Water—The quality of stream water depends upon the proportion of ground water to run off water present. In dry weather there is proportionately more ground water than surface water in the stream, and proportionately greater quantities of inorganic salts are present. This is conducive to development of algae, which, in the presence of sunlight because of their chlorophyl, are able to combine these salts with dissolved carbon dioxide and thus obtain their food supply.

Ninety-nine per cent of the normal strains of pathogenic bacteria disappear at the end of a week's storage and all of them at the end of a month. Water initially good obtained from an upland source will not be improved much by storage; in fact, a deterioration may result. Water from a larger river will almost invariably be improved.

In general, under these conditions, storage will result in decided decreases in: (1) Concentration of organic and inorganic solids by sedimentation; (2) concentration of organic impurities by precipitation and oxidation; (3) color in upper layers by oxidation and the bleaching action of sunlight; (4) concentration of hardness forming salts due to loss of CO_2 by diffusion, on utilization by plants, and by absorption of these salts by plants and animals during growth; (5) the number of bacteria; by sedimentation, exhaustion of food supplies and utilization as food by other forms of life.—A. Gordon Gutteridge, *Health*, Commonwealth of Australia, 5: 35 (Mar.), 1927. Abstr. L. M. Fisher.

Pressure Filtration Plant—A mechanical filtration plant to remove peat stain and counteract plumbo-solvent action in a portion of the water supply at Bradford, England, is described. The supply is from peat lands containing humic acid. Water must be treated with an alkali to prevent lead poisoning. Sulphate of alumina and lime or chalk are added for coagulation, removal of color, and neutralizing the acidity. The chemicals are fed as solution through plunger pumps operated by variable speed direct current motors. The speed is varied automatically with the flow by means of a Venturi meter which actuates a mercurial differential gear which in turn operates a small electrical rheostat.

The decision to adopt mechanical filters in this instance was reached chiefly on account of the following considerations, viz: (a) There is no suitable site on which to erect slow-sand or open gravity filters between the reservoir and the first point of delivery; (b) peaty discoloration can be effectively removed; (c) acidity can be readily neutralized, thus removing or reducing metallic solvency and corrosion; (d) initial cost of construction is less than that of slow-sand filters; (e) contamination from the air and the encouragement of the growth of algae are avoided, as the filtrate is delivered direct to the district of supply; (f) no interruption from frost; and (g) the bacterial purification is as efficient as in slow-sand filtration. The operating and maintenance charges are higher, owing to the cost of the coagulant—sulphate of alumina—used to effect color removal, and the wash water used may be greater, owing to the increased burden on the mechanical filters arising from the decolorization process. But these factors are largely, if not entirely, offset by the interest received on the greatly reduced capital expenditure for the mechanical filters, which entirely remove the peaty stain and give a clear, colorless water.—Anon. *Water Works*, 66:11 (Jan.), 1927. Abstr. E. A. Reinke.

The Standard Milk Ordinance in North Carolina—In 1924, as a result of a preliminary survey, it was found that 21 North Carolina cities had adopted a milk ordinance of some sort and were carrying on control measures. A study of the ordinances brought out very strongly the fact that there existed a great variance in the requirements.

Since it was almost impossible to bring about a uniformity in all the ordinances, the State Board of Health recommended to the cities the U. S. Public Health Service Standard Milk Ordinance. This was done for the following

reasons: (1) Uniform standards of quality were considered to be of basic importance; (2) uniform standards of milk sanitation were advocated; (3) the ordinance was found to be complete, fair, and practical; (4) classification of milk by grades is a sound principle on which to base the establishment of widespread uniformity of milk sanitation standards; (5) it was recognized that the services of an official correlating agency, such as the U. S. Public Health Service, was essential to the widest adoption of uniform, reliable standards.

Of the 21 cities in 1924 that had milk ordinances, 17 have adopted the Standard Milk Ordinance in place of the one they had. In addition, 16 other cities have adopted the Standard Milk Ordinance, thus making a total of 33 having it in effect. Ten cities with populations between 5,000 and 10,000 and 8 cities with populations less than 5,000, have adopted this ordinance.

The main features of the Standard Milk Ordinance are given, together with a discussion of the importance of further safeguarding a high grade raw milk by proper pasteurization, since health authorities are now convinced that no milk can be considered entirely safe in its raw state, no matter how carefully its production is safeguarded.—Malcolm Lewis, *Health Bull.*, North Carolina State Bd. of Health, 42:13 (June), 1927. Abstr. P. R. Carter.

Regarding the Procedure in Sludge Digestion—The process of decomposition in the sludge chamber in the presence of excess and subnormal pressure was investigated. An excess pressure had no influence on the gas production or even on the general decomposition of the organic material. With subnormal pressure, in contrast with the studies of Watson and Watsaws, an increase of the generated gas occurred, evidently on account of the more rapid withdrawal. A more rapid decomposition of the organic material did not, however, take place under these conditions. In opposition to other authors, light had no effect on the process in the digestion chamber. Phenols in the sewage affected the gas-forming bacteria more unfavorably than the liquefiers. Higher sulphates in the sewage resulted in higher hydrogen sulphide content in the gas. Introduction of oxygen delayed and injured the digestion process, as the rapid development of the hydrogen sulphide oxidizing bacteria was arrested. Sewage containing sulphates delays the decomposition process and in such cases larger digestion tanks are therefore essential. Acid sewage modifies the digestion process, especially by slight changes of the hydrogen ion concentration. The addition of 10 g. of chlorine to 1 cbm. of sewage sterilizes the precipitated sludge so completely that its ability to decompose is practically destroyed. Sodium chloride solutions up to 1 per cent have absolutely no effect on the sludge digestion process; up to 3 per cent it is decreased about 20 per cent. These phenomena are explained by a peptonizing action of the salt on the sewage colloids. Sodium chloride diffuses only slightly in sludge mixtures and also the salt in the sludge diffuses very slowly in the surrounding water. Therefore, the amount of sodium chloride present affects the regular automatic conversion of sludge in the digestion tank. F. Sierp. *Tech. Gemeindebl.* 29, 21-24. Translation of an abstract in *Zentralbl. f. d. ges. Hyg.*, 15:496 (Aug. 10), 1927. Abstr. J. K. Hoskins.

Human Ascaris As a Household Infection—An attempt to shed light upon the etiology of Ascaris infestations from a study made in a section of the Republic of Panama is reported. In the rural areas there, human excrement is not used for fertilizer and the source of drinking water is in most cases free from any possibility of fecal contamination,

yet the Ascaris incidence varies from 40 to 90 per cent. The author was able to estimate that the number of ova passed per diem in 8 different households ranged from 2,970,000 to 99,960,000, individual persons varying from negative to 64,760,000. The unique character of this study, however, was the demonstration by a flotation method, of Ascaris and Oxyuris ova, containing motile embryos, in the sweepings from the dirt floors of the homes and dooryards. This leads to the conclusion that such places "are a source of Ascaris infection of considerable importance." It was possible, experimentally, to demonstrate that Ascaris ova in feces under typical local conditions would reach the motile embryo stage in 14 days. Harold W. Brown, *J. Parasitol.*, 13:206 (Mar.), 1927. Abstr. N. R. Stoll.

Experience in Destroying Sewage Screenings By Burning—The sewage screening and screenings disposal plant at Long Beach, Calif., is located near a popular bathing beach which necessitated careful designing and required special operating attention to avoid the creation of a nuisance. Details of the plant design and operation are given by the author who was formerly superintendent of the sewage works at Long Beach.

The old plant was remodeled in 1924 and an additional unit built so as to insure continuous operation on a 24-hour basis. The combustion chamber and the ash pit of the new unit are lined with refractory material, and all walls and roof insulated with the same. Gas is used for fuel and a temperature ranging between 1600° F. to 1850° F. is maintained. This temperature was found to be most satisfactory, as higher temperatures produced clinkers hard to dispose of. The rate of burning in the old unit was about 10.5 lb. of screenings per minute, but in the new unit a much greater amount is handled at less than half the fuel cost. The screenings removed from Long Beach sewage average 30.7 cu. ft. per. m.g., but during the canning season (fish and tomatoes), peak loads run as high as 45 cu. ft. The cost of burning the screenings is estimated at $4.025 per cu. ft., which includes fuel and labor. Although the nearest houses are only 75 ft. from the incinerator stack, no complaints about the operation of the plant have been made.—Robert A. Appleton, *Eng. News-Rec.*, 99:500 (Sept. 29), 1927. Abstr. Ella G. White.

The Disappearance of Typhoid Bacteria in Water—For a study of the reasons for the disappearance of typhoid bacilli in water, water samples from different sources were inoculated with typhoid organisms and stored under similar conditions. The types and numbers of protozoa occurring in the water were also observed. The typhoid bacilli disappeared from tap water, rain water and water from a swimming pool in from 7 to 10 days and their disappearance corresponds with a marked increase of a bacteria-eating protozoon—Oicomonas termo, Cercobodo alexeieffi, Cyclidium glaucoma. With ground water the result was less marked. In one of the experiments, the bacilli disappeared only after 4 weeks in spite of the presence of the same protozoa; in another they were not present after 13 days, while in water from the same source that had been freed from protozoa by filtration they remained 4 days longer. It is concluded that at present unknown factors other than bacteria-eating protozoa are also responsible for the disappearance of the typhoid organisms.—N. L. Wibaut and Isebree Moens, *Verslag d. afdeel. Natuurkunde koninkl. akad. v. Wetensch*, 36:129. Translation of abstract *Zentralbl. f. d. ges. Hyg.*, 15: 486 (Aug. 10), 1927. Abstr. J. K. Hoskins.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D. AND LEONARD GREENBURG, PH.D.

Health of **Office Workers**—According to the federal census in this country in 1920 there were about 3,100,000 persons engaged in clerical work, but interest in their health matters has lagged behind that of the regular industries. Ramazzini in 1713 remarked upon the maladies of clerks who were mostly males in those days, and Thachrah reëmphasized the same in 1831. Today the members of most clerical groups are predominately feminine and unmarried, young rather than middle aged or aged, city or town dwellers, and they may present a selection of persons physically substandard. According to the census, in two large groups, "other clerks," and "stenographers and typewriters," over 51 per cent of both sexes were in the age group 15 to 24 years, and of females, 61 per cent. Tuberculosis of the lungs caused 46 per cent of the deaths in this young age group, with heart disease, Bright's disease, accidental violence and pneumonia, following in the order named. The mortality in this group for tuberculosis was 170.7—highest for all occupational groups. (The paper then discusses in detail various statistics based upon the census and especially the data available in the Home Office of the Metropolitan Life Insurance Company.) In general, females are not only more frequently absent but lose more days from sickness than males, thus, in 1925 males lost 8.82 working days, females 12.44, or 141 per cent of the male rate. However, men averaged 7.08 days absence and women only 4.41 days. Among males there were 1.246 cases of absence per clerk-year; among females 2.824, or 226 per cent of the male rate. A most interesting feature of this study was that sick absence varies quite directly with age; that is, a woman of 25 will in all likelihood have a worse sickness absence record than one of 20.

Distribution of sickness by departments in the organization, of which there were 188, showed that the worst had an experience about 65 times that of the best! Of little importance is consideration of causes of sick absence and it is recommended that the *International List of Causes of Death* be used as a basis for a standard nomenclature in dispensary practice. Of illnesses causing absence among males and females combined over 38 per cent were due to respiratory diseases; 27 per cent to diseases of the digestive tract; and over 11 per cent of the cases among females to dysmenorrhea. Sickness calls in the Metropolitan employes during 1925 and 1926 total more than 150,000, mostly, of course, unattended by absence. The curve of absenteeism drops in midsummer, rises in the fall, drops slightly in early winter, and then rises in a late winter peak. There are two separate types of colds, one of the fall type, the other occurring in mid-winter; there is also a strong suggestion of a relation between a drop in the mean temperature and an increase in colds. This is contrary to a warmer climate such as California, where the incidence of colds varies greatly without marked change in temperature. (The various afflictions of clerical workers are discussed in detail with accompanying tables and graphs.) "Employers of clerical workers cannot

ignore the importance of the problem of time and efficiency lost through disease and it is almost inevitable that they share with their employes the burden of maintaining some mechanism for the relief and control of the situation. The problem is not so much the reduction of sick absenteeism to the lowest possible limit as it is the maintenance of the healthiest possible group of workers."—Wade Wright, *Proceedings of the Convention,* The Life Office Management Association (Metropolitan Life Insurance Company), Oct., 1927, 35 pp.

Toxic Risks of Spray Painting—At the third conference on Industrial Hygiene held in Melbourne in May, 1927, the following resolution was adopted:

(a) Lead paint should not be used in interior painting. The use of lead paints in spray-painting under any circumstances must be regarded as dangerous, and the use of non-lead paints should always receive consideration.

(b) Commercial spray-painting in interiors should be done in properly constructed booths, provided with efficient mechanical exhaust ventilation. The exhaust systems should be so constructed and installed as to operate effectively, independent of weather and adjacent building conditions.

(c) The booths act as extraction-dust ventilating units, and the spray operator should not be exposed to dust and fumes drawn past him to the exhaust fan.

(d) The exhaust system should produce a satisfactory uniform air movement at the booth face under working conditions.

It is recommended also that employes engaged in spray-painting should—

(a) Not spray at right angles to a flat surface, so causing the spray to roll back

(b) Not spray too large objects and thus get out of range of the exhaust

(c) Not spray promiscuously about the room in testing the sprayer

In the matter of safeguards regarding volatile solvents, etc., the special committee recommended that paints, etc., containing benzol should not be used nor should benzol as such be added to any paint material. Where penetrating stains and removers containing benzol are used, as many men as practicable should be employed to minimize the period of exposure to the injurious effects of benzol. Shellac dissolved in wood alcohol should not be used, nor should wood alcohol as such be used in any painting operation. Dr. J. I. Moore, Commissioner of Public Health for Queensland, *Med. Off.,* Jan. 21, 1928, p. 33.

The Determination of Carbon Monoxide in Mines With the "Iodine Pentoxide" Detector—The various methods commonly used by the Bureau of Mines for detecting carbon monoxide include the use of canary birds and mice, the pyrotannic acid method in blood samples, volumetric gas analysis, and the iodine pentoxide method. This is also knowns as the hoolamite method. (The article contains a description of the detector which is composed of a short barrel about 1 inch in diameter and 6 inches long to which is attached a rubber bulb, a tube containing the hoolamite and the indicator tube.) By using more samples of the air, amounts as low as 0.05 per cent can be estimated. While the hoolamite detector does not indicate a deficiency of oxygen or the presence of other gases as carbon dioxide and hydrogen sulphide, nor give warning of the presence of carbon monoxide unless it is actually used (differing from a canary), it affords a reasonably accurate quantitative means of determining, while underground, the percentage of carbon monoxide in the air, which it is impossible to do with small animals. It is an extremely valuable tool in mine rescue work.—G. S. McCaa and John A. Davis, *Circular No. 6057,* U. S. Bur. of Mines, Jan., 1928.

Anthrax Hazard in Pennsylvania—In view of the recent report of several fatal cases in one plant in Philadelphia in recent weeks, it is well to call attention to the carefully detailed study of

14 fatal and 75 non-fatal cases of anthrax which have occurred in Pennsylvania during the 5 years ending 1926, by Dr. Elizabeth B. Bricker, Department of Labor and Industry, Pennsylvania, *Month. Labor Rev.*, 25, 6:1261, (Dec.), 1927.

Prevention of Hydrogen Sulphide Poisoning in Handling and Refining High-Sulphur Petroleums—Several fatal accidents have occurred in the oil fields and at refineries from hydrogen sulphide poisoning. The general characteristics of this gas show that it is heavier than air, is colorless, and has a characteristic odor known as "rotten." It burns in air with a blue flame yielding sulphur dioxide and water vapor. It is therefore an "acid" gas. It becomes less soluble in water as the temperature is raised from the freezing point. It is a highly corrosive agent, leads to blackening of white lead paint, and is extremely toxic, in this respect more so than hydrocyanic acid gas. In high concentration it quickly deadens the sense of smell and the margin between consciousness and unconsciousness and death is very narrow. "Probably one breath of the gas may be sufficient to cause asphyxiation." Exposure to low concentrations causes irritation of the eyes and of the respiratory tract. (The paper next discusses the treatment of victims, the places of danger in the oil refining industry, descriptions of typical cases of poisoning, and the details of precautions necessary in the care of apparatus, tanks, etc. An appendix gives a satisfactory method for the determination of hydrogen sulphide by titrating with iodine solution.)—H. C. Fowler, *Serial No. 2847*, U. S. Bur. of Mines, Dec., 1927, 27 pp.

Ozone Fallacy in Garage Ventilation—Dr. Salls presents a discussion of the literature concerned with the reaction of carbon monoxide and ozone, and from this discussion one must conclude that there is great variance in the literature concerned with this reaction.

The experimental studies which Dr. Salls presents are analyses of the atmosphere from a gassing chamber in which carbon monoxide is mixed with ozone at room temperature. The atmosphere was sampled from the beginning of the mixture of the gases to a period 140 minutes thereafter. The carbon monoxide determinations were made by means of the Sayers-Yant method, using defibrinated steer's blood as a blood reagent. Three samples of the atmosphere were obtained prior to starting the ozonator, the three samples yielding the following results in chronological order: 13, 9 and 7 parts of carbon monoxide. After allowing the ozonator to operate for about 20 minutes, a sample was taken which yielded somewhat less than 5 parts of carbon monoxide. Subsequent samples were taken to the end of 140 minutes. When these samples were plotted against time they fell on a fairly uniform curve which appears to be the curve of absorption of gas by the chamber walls and leakage through them. The starting of the ozonator appears to have altered the shape of the curve in no way.

Dr. Salls concludes that this study indicated no evidence of an appreciable action of the ozone on the carbon monoxide.—Carroll M. Salls, *J. Indust. Hyg.*, IX. 12:503. (Dec.), 1927. L. G.

Review of Literature on the Physiologic Effects of Abnormal Temperatures and Humidities—Among the rather lengthy conclusions reached in this study we note the following:

> The upper limit in atmospheric conditions at which work can be performed efficiently corresponds to a dry-bulb temperature of 100° and a relative humidity of 30 per cent, or 90° to 95° F. in still saturated air, even when stripped to the waist. The optimum temperature at rest is around 66° F.; and with hard work the optimum temperature is 59.5°; 43° F.

was pronounced as too cold with or without air movement, regardless of humidity. In still air no temperature is too low to prevent outdoor work.

The lowest temperature compatible with life is said to be 78.8° F., although LeFèvre found that a rabbit died when the temperature of the rectum had fallen to between 60° and 65° F.

The minimum accident frequency, according to one observer, in factory work in both men and women was at 65° and 69° F. . . . At temperatures above 69° the accident frequency showed only a slight rise in women, but in men it increased rapidly, and at temperatures above 75° it was 39 per cent greater. . . . . During the 16 months preceding the installation of the cooling plant in the Morro Velho mine there were 20 fatal accidents, while during the 16 months period following the installation there were only 6 fatal accidents.

(Many other interesting conclusions are found in this report.)—R. R. Sayers and S. J. Davenport, *Pub. Health Rep.*, 42:933, 1927.

Degree of Nicotine Action on Workman's Organism From Inhaled Tobacco Dust—This study was designed to answer the following specific questions with reference to the problem of nicotine action on workman's organism: (1) the quantity of tobacco dust inhaled by a workman; (2) how the inhaled dust is distributed in the body; (3) how much nicotine is present in the dust; and (4) what amount of the nicotine is alkalized by the different juices of the human body.

The method of making dust estimations is not given but the author presents data showing that from 2.8 to 17.3 milligrams of dust were inhaled by workmen during one hour. Of this amount a portion was obviously exhaled, a certain portion retained in the nose, and a certain portion, from approximately 9 to 55 mg., penetrates into the lungs during a period of 24 hours of exposure.

In attempts to estimate the degree of nicotine alkalization by different body juices, the author has experimented with saliva, gastric juice, physiological saline and intestinal juice to which pancreatic juice or bile, or both, were added. From these experiments the author concludes that the total nicotine intake from inhaled tobacco dust during an 8-hour workday ranges from 0.3 to 1.9 mg., depending on the process at which the worker is engaged. He concludes that the workman employed at rubbing tobacco, the dustiest process, absorbs as much nicotine from the dust as he would by smoking 5 cigarettes a day. This small amount of nicotine certainly does not explain the cases of nicotine poisoning which have been observed, and the author is of the opinion that the atmosphere of tobacco factories contains volatilized nicotine in free condition which is more capable of producing action than is inhaled dust. The average nicotine content of tobacco dust on the basis of several analyses performed by the author proved to be 1.73 per cent.—A. Burstein, *J. Indust. Hyg.*, IX. 12:512. (Dec.), 1927. L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Blood Regeneration in Severe Anemia—X. Assimilation and Conservation of Bile Pigment, Blood Hemoglobin and Muscle Hemoglobin—Hemoglobin prepared from normal dog blood in isotonic saline solution was injected hypodermically into anemic dogs, both intravenously and intraperitoneally. Muscle hemoglobin free from blood hemoglobin was also tried, as was a pancreatic digestion of red blood cells of the dog administered in an alkaline medium. The intravenous injection of dog hemoglobin in varying amounts resulted in all instances in a conservation of the injected hemoglobin amounting probably to 90 per cent or more. While muscle hemoglobin is utilized to form new hemoglobin it is not so satisfactory, as the dog can tolerate only small amounts of this substance compared with blood hemoglobin. Muscle hemoglobin solution is apparently toxic when fed in large amounts. A pancreatic digestion of red blood cells resulted in a regeneration of about 40 per cent and in the case of fresh blood cells given by mouth there resulted only a 7 to 10 per cent utilization, probably due to incomplete digestion of hemoglobin. Dried blood cells in the form of blood paste were fed with a 20 per cent utilization as a result. A number of experiments in bile feeding with dried ox and pig bile gave negative results. Fresh dog bile given by stomach tube or mixed with the standard ration showed some stimulus to hemoglobin production but in some cases results were negative. A discussion follows as to the probable site of the conservation of hemoglobin in the body.

XI. Iron Effect Separated from Organ Effect in Diet—Experiments are recorded in which soluble iron salts corresponding to the iron content of about 300 grams of fresh spleen were added to the standard ration. These small doses resulted in production of an excess of 10-25 g. of hemoglobin, for 2-week periods, above control levels. Two hundred to 300 g. cooked spleen caused an increase of 20-50 g. in the same period. It was found, however, that dogs on a diet of iron salts may or may not respond with increased hemoglobin production depending on the condition of iron shortage. The addition of pig kidney and liver showed a marked increase. It is concluded that this summation of physiological effect of iron salts plus organs does not support the contention that the favorable influence of the feeding of these organs toward hemoglobin regeneration is due to the iron content. —F. S. Robscheit-Robbins and G. H. Whipple, *Am. J. Physiol.*, 83:60-83 (Dec.), 1927.

Studies on the Anemia of Rice Disease—On the theory that bacteremia in this disease is the result of gastrointestinal stasis, the effect of four procedures were studied—first, increasing the acidity of digestive juices; second, through the addition of vitamins A and C to correct deficiency; third, to alter the character of the intestinal flora by increasing acidophilic bacteria; fourth, altering the degree of absorption from the gastrointestinal tract by administering lactose, magnesium sulphate or mineral oil. Adult pigeons, averaging 360 g. in weight, were the experimental animals. The birds were placed on a mixed whole grain diet and after con-

stant weight had been established, records were made of body weight, respiration rate, rectal temperature, red corpuscle count, hemoglobin and blood sugar levels. The addition to the diet of betaine HCl, lactose, vitamins A and C, magnesium sulphate or mineral oil had no apparent influence on body weights, temperature and respiration. Betaine HCl or butter and orange juice in addition to the rice diet had no influence on the red corpuscle count. The addition of lactose, magnesium sulphate or mineral oil prevented anemia in a large percentage of cases. Magnesium sulphate, mineral oil or lactose did not change the blood sugar concentration. It is concluded that the beneficial effects observed in rice disease, so far as the red blood cell count and hemoglobin levels are concerned, following the administration of mineral oil or magnesium sulphate and lactose, is explained by the catharsis and limitation of intestinal bacteremia,—O. W. Barlow, *Am. J. Physiol.*, 83:237 (Dec.), 1927.

Food Poisoning—This is an epidemiologic study of 425 outbreaks of food poisoning in the United States during 1923, 1924 and 1925. It is admitted that accurate statistics are difficult to obtain on account of the fact that food poisoning is rarely required to be reported, although such reports are required in the States of Georgia, Kansas, Maryland, Montana, New Mexico, Oklahoma, Washington, Wyoming and West Virginia. Botulism is a reportable disease in Colorado, Connecticut, Arizona, Idaho, Kansas, Maryland, New York, Minnesota, Oregon, Washington, California, West Virginia and Wyoming. A summary of the data available for the period 1910-1925 inclusive, shows 7,112 cases with 544 deaths, indicating a case mortality of 7.6 per cent. It was concluded that this figure does not accurately represent the mortality owing to analyses of necropsies in assigning the cause of death. A careful study of the records, selecting those cases in which laboratory evidence was reasonably conclusive that the cause of the outbreak was the paratyphoid group, shows a case mortality of 0.4 per cent. Four hundred and twenty-five investigations of alleged food poisoning are summarized for 1923-24 and 1925. The outbreaks bear no relation to the time of the year. Geographically, the greatest number were reported in the middle west, followed by the southern group, the western group and the smallest number in the east. Of the foods alleged responsible, 401 were commercially canned and 70 prepared in the home. The type of food involved was chiefly meat products, fish, vegetables and fruit. It was apparent that neither age nor sex has any incidental influence on the distribution of outbreaks. Of 425 outbreaks, in 28 the food was regarded as manifestly spoiled or off in taste or odor. Of these, 23 were outbreaks of botulism. Eight cases of botulism are recorded in which the food was stated to be normal in odor and taste. Sixty-six cases out of 425 recorded are classified as being caused by the paratyphoid-enteriditis group of organisms, although the majority are not supported by laboratory evidence. In 32 per cent of the series reported, the diagnoses were given by attending physicians as "ptomaine poisoning." The same term was also used by newspaper reporters and others. It is insisted that this loose term should be promptly discarded by the medical profession and that the diagnosis of food poisoning should be supported by epidemiologic, bacteriologic and toxicologic investigation.—*J. A. M. A.*, 90: 459 (Feb. 11), 1928.

Vitamins A, B and C in Collards and Turnip Greens—In determining vitamin B, normal albino rats, 28 days old, and of uniform weight as nearly as possible, were used. All animals were

kept under the same conditions of light and heat, and were fed at a nearly uniform hour seven days a week for 8 weeks. The diet was devoid of vitamin B and distilled water was given *ad libitum*. It was found that 0.8 g. raw turnip greens and 0.9 g. raw collards were sufficient for maintenance over a period of 8 weeks. Cooking according to the process described caused a 10 per cent destruction of vitamin B in turnip greens and 40-45 per cent in collards. In determining vitamin A, rats 28 days old, weighing 40-55 g. were used; 0.02 g. raw turnip greens was more than sufficient to produce growth of 25 g. in 8 weeks, and 0.02-0.04 g. collards was sufficient to give standard growth. Cooking showed no appreciable destruction of vitamin A. In determining vitamin C, guinea pigs were used. The experimental diet consisted of 59 per cent whole ground oats, 10 per cent butter fat, 1 per cent sodium chloride, and 30 per cent skim milk powder. It was found that 0.5 g. of raw collards and more than 1.0 g. of raw turnip greens were required to prevent scurvy. Cooked collards, equivalent to 10 g. raw, gave protection, while cooked turnip greens, equivalent to 8 g. raw, were not sufficient and the animals refused to eat more. Tables are given in each instance showing the growth and survival of rats during the 8-week period. —G. W. Burton, *J. Home Econ.*, 20:35 (Jan.), 1928.

A Milk-Borne Epidemic of Poliomyelitis—In October, 1926, in Broadstairs, England, there occurred an unusually severe outbreak of poliomyelitis which presented features not generally encountered in epidemics of this disease. This outbreak started and subsided suddenly, 62 cases being reported between October 14 and 29. The epidemic was confined strictly to Broadstairs and did not extend to the adjacent cities. These localizing features were rather unusual. Evidence of flaccid paralysis was obtained in 43 of the cases while 28 cases were classed as non-paralytic, although some of them exhibited encephalitic symptoms. It was observed that the encephalitic type of the disease was much more common in this epidemic than in the experience of the writer in the United States. Investigation disclosed that practically all the cases among the residents of Broadstairs were supplied with milk from the same dealer. The evidence concerning the milk supply pointed strongly to the milk furnished by this dealer as the common source of infection, and further suggests that contamination of only one grade of his milk which came from a single farm, was responsible for the epidemic. The author further concludes that the distribution of cases of poliomyelitis in the Broadstairs epidemic in point of time indicates that the majority of cases were simultaneously infected. It is also inferred that the incubation period in the majority of cases was between 6 and 14 days. The age distribution in this epidemic differs from that usually observed, in that most cases occurred between the ages of 5 and 15. This is largely accounted for by the cases in boarding schools and convalescent homes located in this city whose population consisted largely of children between these ages. —W. Lloyd Aycock, *Am. J. Hyg.*, 7:6 (Nov.), 1927.

Food Poisoning Probably Caused By Bacillus Proteus—A report of poisoning among students at Colgate University, Hamilton, N. Y., October 4, 1927, the cause of which appeared to be chicken which had been purchased on Sunday and not used until Tuesday. Fortunately some of the chicken was secured and *B. proteus* found together with streptococci and colon bacilli. Samples from the vomitus and stools of the patients also yielded *B. proteus* which were found to be pathogenic for

guinea pigs. Symptoms are recorded which simulate those caused by the paratyphoid-enteriditis group of organisms.—Dr. Morrill L. Ilsley, *J. A. M. A.*, 90:292 (Jan. 28), 1928.

The Relation of Deficiency of Vitamin B to Atony of the Stomach—Five rats of known history were placed on a vitamin B deficient diet supplemented with 1 per cent yeast extract for 6 weeks. Barium carbonate meals were then given and radiograms made, which disclose a distension of the cardiac portion of the stomach, in some of the rats so great as to be visible externally.

Control rats on a sufficient vitamin B diet were all radiographed showing no enlargement of the cardiac and the stomachs only about one-third the size of those on the deficient diet. Control rats were of the same weight as the deficient rats when the radiograms were taken. The authors conclude that the atonic conditions among some patients may be the result of vitamin B deficiency.—Dr. M. J. Rowlands and Dr. Ethel Browning, *Lancet*, 1:180 (Jan. 28), 1928.

The Possible Toxicity of Buttermilk Soured in Zinc Containers—The investigators first confirmed the previously reported presence of zinc in fresh milk and cultured buttermilk and further found that cultured buttermilk dissolves considerable quantities of zinc in galvanized containers which amounts depend on the acidity of the milk and the time factor. Rats and swine were used as experimental animals, the former after being placed on the experimental diet were given buttermilk soured in glass and in both old and new galvanized utensils. Measured amounts of zinc lactate and zinc carbonate were also administered in two lots. The lot fed 0.5 per cent of zinc lactate made fair growth and reproduced but a large proportion of the off-spring died, while the lot fed 1 per cent of the zinc carbonate made poor growth and did not reproduce. For tests with swine, 100 pound Hampshire gilts were the experimental animals, divided into 4 lots, one being fed 0.5 per cent of zinc carbonate, another plain buttermilk, a third buttermilk from a galvanized tank, and the fourth, cultured buttermilk held from 12 to 48 hours in new galvanized iron pails. In lot 1, after feeding zinc carbonate for 2 weeks, one animal developed stiffness of the hind legs but the mate was unaffected. Apparently no deleterious effects were observed in the case of sows which were fed buttermilk stored in galvanized tanks or pails. The authors conclude that small amounts of zinc lactate such as might be found in food does not markedly affect growth and reproduction in rats.—A. D. Burke and Frank Woodson, *J. Dairy Sci.*, 11: 79 (Jan.), 1928.

Determination of Vitamin A Content in Liver Oil of the Dog-Fish Squalus Sucklii (preliminary note)—The content of vitamin A in the freshly prepared liver oil of the dogfish (*S. sucklii*) was compared with that of a standard cod liver oil stated to contain 12,000 units of vitamin A per ounce, using curative and prophylactic tests with rats on the Zilva-Miura basal diet. Comparisons of the weight increases of rats given cod liver oil and the dogfish liver oil indicate that for equal volumes the dogfish liver oil contains between 5 and 10 times the number of units present in the cod liver oil.—H. N. Brocklesby, *Canad. Chem. & Metall.*, 11 (1927), 9:238, 239, figs. 2. Abstract. *Exper. Sta. Rec.*, 58:294 (Feb.), 1928.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

The Mother-Fed Baby—Dr. Waller's address given to the Winter School for Health Visitors contains so many excellent points which are often insufficiently emphasized that it seems worth while to review them.

In many bottle-fed babies early loss of muscle tone becomes an important warning of faulty nutrition and particularly of oncoming rickets. Dr. Waller does not, however, feel that mother's milk is an infallible protection against rickets and urges that the effective diet and way of living on the antirachitic vitamin of mother's milk be borne in mind. It is quite possible this may account for the steady gain of some breast-fed babies whose mothers may not keep as neat homes as more conscientious mothers, but who do get out of doors daily into the sun and fresh air.

Immunity against the so-called children's diseases is not always certain in the breast-fed. Measles is rarely contracted before the seventh or eighth month. Most nursing mothers in this group had had measles, but so had the mothers of bottle-fed infants, and the most that could be claimed was that the incidence of measles was somewhat delayed in the breast-fed infants. Pertussis, however, is common any time after the first month of life, nor did breast milk appear to protect from this or from diphtheria and smallpox, although recent vaccination of the mother appears to lessen the chance of the baby's contracting smallpox. In cases of congenital syphilis Dr. Waller feels strongly that both the breast-fed baby and mother should be treated and not the mother alone. He agrees, of course, that the tuberculous mother should not nurse her baby. Breast milk not only helps to combat disease when it occurs, but it is the only perfect food during the baby's illness and convalescence.

The close mental—one might almost say spiritual—and physical bond between the nursing mother and her baby was especially well brought out. While firmly supporting the principle of punctual feeding Dr. Waller feels that the strict separation of the mother from her baby during the lying-in period is "bad natural history." The mother "should be allowed to handle her baby and cultivate and indulge her maternal feelings."

Certain gastrointestinal disturbances occur in breast-fed children following such things as worry, quarrels, shocks, which affect the mother. A feed shortly after some such disturbance frequently provokes vomiting in the child, and sometimes this occurs with the return of the menses for 2 or 3 three days, but this is not to be taken as sufficient reason for stopping breast feeding. The breast-fed baby frequently runs a risk of catching its mother's cold, and this, in the neonatal period, is a serious occurrence. The mothers should be assiduously taught to mask themselves when feeding their infants. Colds, however, are generally less severe in the breast-fed than in the bottle-fed baby.—

Dr. H. K. Waller, *Maternity and Child Welfare*, Feb., 1928.

Rheumatic Infection in Childhood—Rheumatic infection in children is doubly serious in that it entirely disables them during the attack and also tends to produce permanent cardiac injury. This report from the Ministry of Health, England, is a study of the bacteriology, incidence and institutional treatment of acute rheumatism in children in connection with the prevention of heart disease.

Diseases of the heart and circulation account for 188 of every thousand

deaths. Of these 40 per cent are probably due to rheumatic infection. If we turn to the number of patients in hospitals with cardiac disease we find the cause is definitely acute rheumatism in 90 per cent of the cases under 10 years of age, 80 per cent between 10 and 20 years, 60-70 per cent between 20 and 40 years, so that nearly all cardiac deaths under 40 are due to "rheumatic infection." The poorer the home the greater the risk of infection; also the younger the children having rheumatic infection the more likelihood of cardiac involvement.

Rest being a great factor in the prevention of permanent heart damage following infection, institutional treatment seems to be indispensable. Treatment in the child's home or at the ordinary convalescent home is rarely successful. It is best done in institutions devoted entirely to cardiac patients. Complete rest in bed can, however, be over-prolonged. The standards now used in the institutions mentioned are complete rest until 3 weeks after, (1) the pulse-rate and temperature have become normal; (2) anaemia has disappeared; (3) the heart signs are unchanged. It should always be borne in mind that one attack renders the child more liable to another and every precaution should be taken to prevent recurrence.

(This study follows that made by the Ministry of Health, England, in 1924 and dealing with the insured population over the age of sixteen).—*Mat. & Child Welfare, London,* Jan., 1928.

Quantitative Study of Ultra-violet Transmitting Glasses—In view of the importance of the subject, it is highly desirable that as many studies as possible be made of the efficiency of ultra-violet transmitting glasses. The authors in their study used a series of quartz lenses and prisms so arranged as to enable them to select wave lengths or groups of wave lengths and to make actual quantitative measurements.

The conclusion to which Goodman and Anderson come may be expressed by their final statement, which is as follows:

"In conclusion we would like to point out that a number of excellent window glass substitutes for transmitting the short ultra-violet rays of the sunlight are now available. We have discussed briefly the available data on the ultra-violet of sunlight, referring primarily to its variability in quality and quantity with time of year and weather conditions. We know of no evidence that has been advanced to substantiate claims that health would be improved by using such glass substitutes, and until carefully controlled experiments have demonstrated their value, their employment as an aid to health should be advocated with reservations."—Herman Goodman, M.D., and William T. Anderson, Jr., Ph.D., *Boston M. & S. J.*, Jan. 12, 1928.

Study of Stillbirths Occurring in 4000 Consecutive Deliveries—At the Woman's Hospital 4,000 deliveries were studied in connection with maternal mortality, infant mortality and stillbirths. As Dr. Lyon so aptly states, these 3 points illustrate statistically "efficiency and good treatment in a most impartial way" on any obstetric service.

Among these 4,000 deliveries there were classified as stillbirths those babies who never breathed even though the heart-beat continued after birth and those who were delivered between the 28th week and term. On this basis 105 stillborn babies and 104 mothers (1 case of twins) were gone over in careful detail. Autopsy was performed in 53 cases.

A separate study was also made of 41 cases in which the heart was heard during part or all of labor. An analysis of these 41 cases suggested that 8 babies

might have been saved if a different method of delivery had been used, and 12 others if earlier operative interference had taken place. In the remaining 21 of this particular group the stillbirths seemed unavoidable and a detailed summary of diagnoses is given. This article presents so valuable and comprehensive a survey of one of our most puzzling problems that we venture to quote the remainder of the summary in full. Presumably no maternal death occurred in the group studied as no mention is made of maternal mortality.

SUMMARY

1 There were 104 patients who had 105 stillborn babies, or 26 stillbirths per 1,000 deliveries.

2 There were 85 of these patients who had been attending the prenatal clinic, giving 21 stillbirths, among clinic patients, per 1,000 deliveries.

3 There were 25 patients who showed evidences of toxemia, and 4 of these had convulsions.

4 Nine patients among the 79 who had Wassermanns were 4 plus. One showed clinical evidences of syphilis. To these luetic mothers 2 babies were born with syphilis. No other babies gave any signs of syphilis.

5 There were 61 abnormal deliveries, 22 being by forceps and 39 by breech.

6 There were 90 patients who had normal pelvic measurements.

7 There were 37 premature babies and 44 were macerated.

8 There occurred 11 cases of prolapsed cord in 10 of which it was a contributory or actual cause of stillbirth.

9 There were 53 babies autopsied and 12 of these showed cerebral injury.

10 In 55 patients no fetal heart was heard on admission, and in 3 it was doubtful. The heart in 47 was heard on admission and in 41 of these subsequently during part or all of the labor.—

Edward C. Lyon, Jr., M.D., *Am. J. Obst. & Gynec.* Oct., 1927.

Great Britain's Shortage of Young People—"As an aftermath of the war, Great Britain expects within the next few years a considerable decrease in the proportion of boys and girls 14 to 18 years of age in the general population, with a corresponding decrease, estimated to be about 389,000, in the number seeking juvenile employment. This circumstance has inspired the authorities to recommend an investigation into all the prospects and conditions of juvenile employment in various areas and trades, an inquiry which will greatly add to the industrial information already in the hands of juvenile-employment committees, and thus at the disposal of parents, children leaving school, and welfare workers."—*World's Children*, Children's Bureau, Dept. of Labor, Feb. 24, 1928.

Hospital for Crippled Children, University of Chicago

THE Home for Destitute Crippled Children of Chicago is to transfer its main hospital to the campus of the University of Chicago, where new buildings providing 100 beds will be erected. Part of the present plant of the home will be maintained as an emergency hospital and free dispensary for the west side. The hospital will remain under the jurisdiction of the institution, but the university will provide the medical care. This is the fifth hospital for children's work now connected with the university, and its addition means another step toward establishing a clinic similar to those in Vienna and Berlin.

PUBLIC HEALTH NURSING

MIRIAM AMES, R. N.

Tioga County Ends Demonstration Period—The Tioga County Maternity Nursing Service developed under the joint direction of the New York State Department of Health and the Maternity Center Association in 1925 has as its object: "The working out of practical methods and standards of maternity hygiene work in rural communities using as a basis the methods and standards employed by the Maternity Center Association in New York City." This work was part of the Sheppard-Towner program.

In the beginning, it was agreed that "no prenatal medical clinic will be started unless there seems to be a special need, but patients will be brought into contact with the local physicians by the nurses and we will try to have the work, ordinarily done at a clinic, done by the doctors for each individual patient." It was agreed to begin with Maternity Center technics and to make changes as they were indicated. There was only one change made: fewer postpartum visits were necessary to secure the same results.

December 31, 1927, closed the 2-year period of the demonstration. The work of the nurses has become generalized * and the County has appropriated sufficient money which, with the money received from the State County grant, will finance this county nursing service.

At the end of the first year, 72 per cent of the pregnant women in the county were receiving nursing care and 75 per cent of this group had been reported by the private physicians. The second year, 356 patients received care and more than one-half of them were reported by physicians. The majority of the balance made personal application for the service. (There are approximately 375 births a year.)

The private doctors in Tioga County did everything possible to facilitate the development of this service. H. C.

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* This experience emphasizes again that no adequate maternity service can be carried on without the development of a general service. Only when we consider everything that may affect the health, happiness and peace of mind of the pregnant mother do we give adequate care.

A Campaign Against Rickets—A study of the vital statistics of the Mulberry Health Center district in New York City showed an unusually high death rate for infants from 6 months to 1 year with one-third of the deaths from pneumonia. It is believed that rickets causes a susceptibility to colds, bronchitis and pneumonia and, since rickets is almost universal among infants, it is hoped by reducing the prevalence of rickets the high infant sickness and death rate can also be reduced.

For this reason a campaign against rickets with the coöperation of physicians, midwives, health agencies, druggists, cod liver oil companies and prominent citizens has been launched by Mulberry Health Center, a branch of the New York Association for Improving the Condition of the Poor.

Talks illustrated by charts, slides and films are given to Mothers' Clubs, Parent Teacher Associations, etc., to stimulate interest in sunning babies during all months when this is possible and in giving potent cod liver oil regularly as a supplementary treatment.

Classes have been formed to teach mothers the harmfulness and the prevention of rickets. These classes reach

pregnant women and mothers of babies under 2 years. Classes for older girls receive instruction in infant care, including the importance of sunshine and "bottled sunshine."

The hope of Mulberry Health Center is to broadcast the knowledge of rickets and the saving properties of sunshine and cod liver oil through posters displayed in shop windows, libraries, banks, health and welfare organizations; through flyers which are left in every home; through a pamphlet, *Rickets Must Go*, which has been distributed to the educators in the district. This material used is available to other agencies. Information may be had by writing to Mulberry Health Center, 256 Mott Street, New York, N. Y. C. R. P.

Community Health Resources Studied—Surveys of one kind or another, dealing with either self-analysis or group analysis, are growing in popularity. In weighing the pros and cons of health services, these investigations are especially useful. A study of community health resources is being undertaken on a state-wide basis by the Department of Public Welfare under the auspices of the General Federation of Women's Clubs, and endorsed by the American Public Health Association. This organized effort on the part of so large a body of women, enlisted in behalf of public health projects, will, without a doubt, result in direct benefit to many communities.

The study is in the nature of a contest, and the award will be made to the state having the greatest proportion of Women's Clubs making studies. The award, which will be contributed by the American Public Health Association and the American Child Health Association, will be made at the close of the contest, March 31, 1928, in a form to be worked out in consultation with the official health agencies and the authorities of state and federal departments of health —a wise provision designed to meet the immediate need of the particular state in question.—Suggested Outline for the Use of Women's Clubs in the Study of Local Nursing Services, *Pub. Health Nurse*, XIX, 12:620 (Dec.), 1927.

Cleveland's Study of the Needs of Chronic Patients—The facts brought out in the survey made by Cleveland of their problem of chronic patients may be helpful to other communities that are aware of the imperfections of the care which they are providing for this group. Howard Whipple Green, Secretary of the Cleveland Health Council, has given a brief analysis of this study in the November issue of *The Nation's Health*.

The 460 cases studied were patients either in hospitals or at the City Infirmary, or known to the nursing associations and family case working groups in June, 1927. They were chosen according to the definition of a chronic given by Dr. Ernest Boas as "one who requires hospital care for a period from 3 months to several years."

Of these 460, 26 per cent were in need of medical study for diagnosis and treatment; 52 per cent in need of nursing care only, and 22 per cent in need of custodial care only. Three hundred and ninety-eight of the 460 patients were classified as indigent, and 410 of them eligible for care in a city chronic hospital. At the present time a large number are occupying beds in hospitals for the acute which should be available for the acutely ill, and which are much more expensive to maintain than beds in adequate hospitals for chronics would be. A large number are also being cared for in the much overcrowded City Infirmary.

The age groups show 27 per cent under 40, and 60 per cent under 60 years of age, and of these a certain number could probably be returned to their homes and to work after proper

diagnosis and treatment, which would be available in a chronic hospital. There are many who are receiving inadequate care at home and would benefit by care in a chronic hospital. In other instances removal of the chronic patients from the home would release members of the household who need to work to contribute to the support of the family.

On the whole, there seemed to be clear indication of the need for a city hospital in Cleveland exclusively for chronic patients.

These findings will be of interest as useful preliminary material on a subject which is to receive much attention and study throughout the country in the near future.—An Analysis and Classification of Cleveland Chronics, *Nation's Health,* IX, 11 (Nov.), 1927.

K. E. P.

Tuberculosis in Children—A sound and concrete article on "Tuberculosis in Children" by Dr. J. A. Myers, Director of the Lymanhurst School in Minneapolis, appears in the December issue of the *American Journal of Nursing.* The clear-cut discussion of diagnosis, treatment, and prevention should appeal to every public health nurse, whether or not she is doing specialized tuberculosis nursing.

Diagnosis in children requires great patience and understanding, says Dr. Myers. It begins with:

History—of previous illnesses, of the nature and quality of the child's food, of his physical activities and attitude toward play, and of his growth.

Examination is the next step. This includes: The tuberculin test, which must be understandingly interpreted; microscopic examination of discharges; physical examination, with emphasis on the lymph nodes and joints, and X-ray of chest and other suspected parts.

Treatment in childhood is more hopeful than at any other period in life, perhaps because tuberculosis in children is apt to be a disease of the lymph nodes, which are in themselves protective mechanisms.

Conservation of energy is one of the first requisites in treatment. The child should be under medical and nursing supervision, that activities may be carefully regulated. Food of the right kind and amount is essential; a good deal of food is usually advisable. Good ventilation—air baths and heliotherapy—are also important factors in treatment.

Prevention is, of course, all-important. Unreported cases must be watched for. Known cases must learn how to protect others and be led to accept responsibility for doing so. Food must be uncontaminated; milk should be pasteurized. Children should be taught personal hygiene, and thoroughly understand how to keep themselves efficient and strong.

In conjunction with this discussion, it is interesting to refer to the article on Standards for Tuberculosis Work in a Generalized Nursing Program, an outline of East Harlem findings, published in *The Public Health Nurse* of November, 1926 (XVIII, 11:578).—J. A. Myers, M. D., Tuberculosis in Children, *Am. J. Nurs.,* XXVII, 12:1038 (Dec.), 1927.

L. A. D.

The Public Health Nurse in the Control of Communicable Diseases—The public health nurse holds a strategic position in the prevention of communicable disease. Her access to homes gives her an opportunity of discovering sources of information which might not otherwise be known. Although she is not able to make diagnoses, she should refer to the health officer at once persons whom she considers suspicious of having reportable diseases. As different communities may have slightly different procedures and beliefs in regard to the use of vaccines and sera, exclusion from school, quarantine, etc., it is necessary that she be

advised by the local health officer as to the practices in her community.

Some diseases are entirely preventable, such as diphtheria, smallpox, and typhoid. The attention of research workers is directed to others in the hope of also finding the means of completely controlling these. As example is the best teacher, the nurse should be protected from diseases where protection is available. Dr. Sayer also advises that she be Dick tested and immunized if found to be susceptible to scarlet fever.

Toxin-antitoxin and antitoxin are the weapons against diphtheria, each powerful in its place; antitoxin to give relief where cases exist or to protect exposed persons from the disease; toxin-antitoxin when there is time enough to allow protection to develop. All children who have received toxin-antitoxin may not be immune and, therefore, it is necessary to have the Schick test given to make sure protection is established.

Vaccination against smallpox will give absolute protection for several years. Where cases of the disease exist, the nurse can be of use in helping to trace all possible contacts and checking up on their vaccination.

The best defense against typhoid is immunization by means of typhoid vaccine. Persons who have had typhoid should also be watched to determine carriers and to make sure that no carrier is a food handler.

As the use of serum in the treatment of scarlet fever is still unstandardized, the nurse should know how the health officer regards the use of this. The scarlet fever serum may be compared to antitoxin as the means of lessening the severity of scarlet fever (but not the length of the quarantine period). The Dick test is comparable to the Schick test. In scarlet fever, toxin is useful in epidemics as immunization develops rapidly. Immunization may cause severe local and general reactions.

Doctors vary widely in their opinions regarding the use of vaccine as a treatment or as a prophylactic in cases of whooping cough. Here, again, the nurse must be wary in advising the use of vaccine and should be guided by the opinion of the health officer.

In cases of measles, it is the special work of the nurse to prevent the disease among infants and small children, the group in which the mortality is greatest. The doctor or health officer is the only one who should suggest the use of convalescent serum.

Nurses may frequently be asked what should be done in cases of dog bite. The wound should always be cauterized by fuming nitric acid. Anti-rabic serum can be given by the attending physician. The head of the dog should be sent to the state laboratory for examination or the dog kept under restraint.—Stanley Sayer, M. D., *Pub. Health Nurse*, XX, 1:4 (Jan.), 1928. B. J. B.

Department of Nursing, Medical College of Virginia—To the graduate nurses of Virginia belongs the credit of presenting a foundation for the Chair of Nursing to the Medical College of Virginia in Richmond, which will be known as the Sadie Heath Cabaniss Department of Nursing.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Equipping a Campaign—A picture of extensive and varied equipment required for a successful publicity campaign is provided in the catalogue of the 1928 Christmas Seal Sale supplies now being distributed by the National Tuberculosis Association. In addition to campaign manuals and press material the following are offered: posters (11 by 14, 3 styles; 19 by 26; 24 sheet); shop early cards; easel cutouts; poster snipes (2½ by 19; 3 by 28); letterheads; team workers' envelopes; booth envelopes; envelope stuffers (3 styles); follow-up cards; prospect cards (3 styles); personal solicitation cards; lantern slides (2 styles); motion picture trailer (150 feet; 15 feet); stories for children; talking points; self service coin box; bangle pins; buttons (2 styles); head dress; arm bands; electrotypes of Christmas Seals (4 styles); electrotypes for follow-up cards; electrotypes of double-barred cross; electrotypes of envelope stuffer.

When Is a Report a Report?—That an annual report is merely a historical document when it appears six months after the year ends is the contention of C. E. Ridley, National Institute of Public Administration. Under the heading "Promptness" in a study of 12 "typical current municipal reports" Mr. Ridley says: "Only two of the twelve reports were available for distribution within six weeks of the end of the period covered. Five of the twelve reports were not available until six months or more had elapsed. In this rating no credit whatever is given for a report six months or more late, for it is contended that by that time it has lost all of its news value and therefore its usefulness depends alone upon whatever function it may serve as a means of recording financial statistics and historical events—purposes hardly justified in a report to the taxpayers on the current operation of their municipal government." The 20 points for judging the reports include: Promptness, Size, Important facts, Attractiveness, Diagrams and Charts, Table of Contents, Organization Chart, Recommendations and Accomplishment, Comparative Data, Propaganda. "Propaganda" would better be "Personal Publicity" (photographs of officials, etc.) for the entire report is "propaganda."—Appraising Public Reports. *National Municipal Review,* 261 Broadway, New York, N. Y. March, 1928. 50 cents.

Diphtheria Dramatized—"Delivered with a rush to the speakers' table by a bellhop this telegram introduced a special session of our Conference of State and Local Committees on Tuberculosis and Public Health, State Charities Aid Association of New York:

> A murderer of little children is loose in New York State and we believe this killer is now at the Hotel Roosevelt. Won't your health conference find a way to help us?
>
> The Children of New York State.

"The chairman, after solemnly reading the telegram, asked the audience what was to be done. A voice from the rear of the room declared, 'Let's catch this murderer and hold a court to try him.' The suggestion was unanimously accepted by the group, a bailiff and a sheriff were appointed, the door at the rear of the room opened at once and a

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

judge in black robes entered followed by the sheriff who dragged a figure garbed in black with a red mask who was labeled 'Black Diph.' The bailiff called the court to order in a loud voice, ordering all to stand and take off their hats. The judge proceeded solemnly to the bench, rapped for order and the 'trial' began.

"This unique introduction opened the special session on diphtheria prevention. The murderer was accused of slaying 264 children during 1927 in New York State, outside of New York City, and of maiming nearly 4,000 others. The prosecuting attorney was out for blood and called on a series of imposing witnesses to convict the murderer before the Court.

"These witnesses brought out the essential facts about the nature of diphtheria, its prevalence in the state, the principal points about diphtheria prevention campaigns, all conducted in regular Court procedure, with variations. It served to catch the attention of the group and to hold it for over an hour. The Judge in his charge to the Jury summed up the evidence and recommended a verdict banishing the murderer from the state.

"The stunt worked so well at this meeting and required so few properties and time to work it up, that it appears to be well adapted for use locally not only to call attention to diphtheria but to tuberculosis. It could be used to advantage in the organization meeting for a diphtheria prevention campaign, or early diagnosis project.

"What do you think of it?"—Robert W. Osborn, S.C.A.A.

A State Diphtheria Poster Contest—A poster contest for students in the recognized school art departments in New York outside of New York City is being conducted by the State Department of Education in collaboration with the New York group of state agencies combating diphtheria, and with the coöperation of the National Poster Art Alliance. The highest prize will be an art scholarship amounting to $365. The contest runs from February 15 to May 15. The plan as a whole offers practical suggestions for contests in other states. The statement of the diphtheria problem addressed to the students is well done, and the suggestions to the students with the contest rules could be adapted elsewhere. For copies address Marie F. Kirwin, State Committee on Tuberculosis and Public Health, S. C. A. A., 105 East 22d Street, New York, N. Y.

Using Words That Other Folks Use—A staff worker was recently making school inspection in a small town which she had visited some months previously. She asked of a small person undergoing inspection, "And how is your sister?" "Oh she's pretty well, but she has tuberculosis."

"She has tuberculosis?" Why when did you learn that?"

"You said so!"

The records were looked up. The inspector breathed a sigh of understanding when she discovered that the girl had been sent home because of pediculosis, or what ordinary folk call lice.—Reported in *Michigan Out-of-Doors,* Lansing, Mich.

Do We Know? Or Do We Think We Know?—What does the "average" man do in a museum or in an exhibition?—

He wanders aimlessly, yes, but not blindly. His attention is drawn to this and distracted from that. He must have glimmering interests which might be fanned into overt enjoyment. Yet, this casual visitor is in the main a mystery and, if he is to be dealt with effectively, there needs be added to the talking about him and thinking about him deliberate observation of his behavior.

That deliberate observation of his public can be of service to the museum administrator (or the organizer of exhibits—Editor) should not be a novel idea. If there is any single predominant achievement of the psychology of the past quarter-century it lies in the revelation that so far as human nature is concerned acquaintance with is often a far cry from

knowledge about. . . . Most of us felt quite well acquainted with American intelligence before the scientific scrutiny of that capacity in the white draft. And we were acquainted with that intelligence—we were even able to get on with it moderately well—but the deliberate inventory taken by the testers revealed unsuspected facts. Similarly in the present case, there is no reason to believe that the museum director is not acquainted with the casual visitors who wanders through his precincts. Yet, only a few hardy souls would claim that deliberate observation can add nothing to what has been learned informally and passively.

. . . At the time our studies of the museum visitor were beginning, the Associated Press quietly announced what was under way. Immediately the letter writers and the editorial writers began to volunteer to solve our problems, not by doing our observing for us, but by replacing observation with argument. . . . We wanted to find out as accurately as possible what is actually going on in the museum. And we saw no other way of getting such information than by going after it directly and deliberately.—

In "The Behavior of the Museum Visitor," by Robinson, Sherman and Curry. American Association of Museums, Washington, D. C. 1928. 78 pages. $.75.

This preliminary report is based on the first two years' work on a study financed by the Carnegie Corporation. It considers museum "fatigue"; the effect of size, position and context upon the individual picture; and guidance by pamphlets. The study suggests application to health exhibitions, and is a reminder of the need of scientific study of human behavior under the impact of various forms of education. Not until such studies are made can we know where we are at in our lavish expenditures of time and money on public health.

"Health Promotion Week"—In Illinois the week is scheduled for two periods: April 1-7 in the 52 counties to the south, and April 22-28 in the 50 northern counties. The week will include the following: Health Sunday, Dental Hygiene Day, Dental Examination Day, Food Facts Day, Diphtheria Prevention Day, School Health Day, Heart Disease and Cancer Prevention Day.

The "program suggestions" for the series of days are simple, practicable interpretations of the themes as they should be presented by local committees. The concreteness of the topics for the days is a happy contrast to the plan for many health weeks. Unfortunately, this concreteness is partly nullified by the diversity of topics represented in the "educational services and material available" through the state department. Many local committees are likely to distribute printed matter unrelated to the topic of the day. The full program and other material appears in *Illinois Health News*, State Department of Public Health, Springfield. Feb., 1928. *Free.*

Can It Be Instructive?—A state department of health offers in its lists of motion pictures "a one reel combination of four subjects presented in animated cartoon form. It deals with diphtheria, prenatal care, infant feeding and the house fly. Very entertaining and instructive for any type of audience." Probably the "combination" picture is entertaining, but can it be instructive? Can "any type of audience be *instructed* in one session on so many diverse subjects?" Of course, if not too "entertaining" the picture may convince almost "any type of audience" that something or other "will get them if they don't watch out!"

Publicity and Education at Memphis, May 2-9—Five morning sessions and 8 afternoon and dinner sessions, plus several informal luncheon gatherings make up the program of the Committee on Publicity Methods and the Educational Publicity Division of the National Conference of Social Work meeting at Memphis. Among the topics will be: Making Up the Year's Program in Publicity (national, large city, small town), Interviews with secretaries of large

givers on how publicity and appeal letters look to them, Outstanding Publicity Ideas of the Year (including, we hope, some diphtheria and other health features), To Sob or Not to Sob—Trial of the Sob Sister, Letter Clinic, Integrity in Publicity—facts and ethics, The Use of the Welfare Appeal in Commercial Advertising, Where the Publicity Worker Gets His Point of View and Technic, The Use of Demographic Areas in Publicity. Zona Gale will discuss Literary Values in Social Work. For program address Committee on Publicity Methods, 130 East 22d St., New York. Health workers will be welcome. Awards will be made for "unusual achievements in publicity"—newspapers, letters, printed matter. For conditions write the Committee. The exhibits will include much that is new and helpful, and the headquarters will have opportunities for meeting specialists.

COÖPERATING GROUPS

A health program for parent-teacher associations appears in Parent-Teacher Handbook for North Carolina. University of N. C. Press, Chapel Hill, N. C. 50 cents.

The American Junior Red Cross is 10 years old. What it has done and is doing is told in *Red Cross Courier*, Washington, D. C., Oct. 1, 1927. *Free.*

A School Health Appraisal Form, 8 pages, was distributed in September, 1927, by the Iowa State Department of Health to the Parent-Teacher Association of the state. In addition to sending copies of the filled-in form to the State Department of Health, every association was urged to discuss the findings in a November or December meeting.

Condensed information and sources of information about organizations—boys and girls, physical education, etc., are given in Sources of Information on Play and Recreation, by M. P. Williams. Russell Sage Foundation, 130 East 22d St., New York, N. Y. Revised 1927. $1.00. With references to material on recreational occupations for camps and institutions.

POPULAR HEALTH ARTICLES

"The Cause of Modern Baldness." *Literary Digest*. Feb. 4, 1928.

"The Dark Arrows of Phoebus," by Frank Thone. *High School Service*, American Red Cross, Feb., 1928. 15 cents. The sun, vitamin D, and rickets.

"Uncle Sam Fitter Than Ever." *Literary Digest*. Feb. 4, 1928. "1927 was the healthiest year."

"Newspaper Recruiting of Students," by Mary Goodyear Earle. *Trained Nurse*, New York. Jan., 1928. One of a series of vocational talks on the professions open to women in the *Herald-Tribune*, New York, N. Y.

EDUCATIONAL MATERIAL

One of the best diphtheria folders I have seen was issued by the Cleveland Health Council, 510 Electric Bldg., Cleveland, O. The most difficult words used are explained thus: "immune (cannot get the disease)" and "sus-cep-table (liable to take the disease)." Good size type and well-printed. Ask for a copy.

Another diphtheria folder rather good in its approach to the reader comes from the Wisconsin State Board of Health. But it has many "hard words," and probably gives more information than is necessary.

Mothers Will Gossip says some "Gossip like this means trouble and sometimes Death!" such as, "Give him something to eat when he cries," etc.; and "Gossip like this means intelligent help that develops fine healthy babies," such as, "My baby was a skeleton until the Health Station taught me about his feeding." Four baby foot-prints, a striking cover design, show before and after care of fallen arches.—Children's Health Service, 578 Madison Ave., New York, N. Y.

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B., DR.P.H.

Traveling Expenses and Income Taxes—Whether members of the American Public Health Association who pay their own expenses in order to attend the Annual Meeting and other professional meetings can deduct these expenses in computing their federal income taxes is now uncertain. In 1922 the U. S. Bureau of Internal Revenue ruled that physicians could not do so, but later the Board of Tax Appeals allowed such a deduction by a chemist who attended a meeting of a national chemical society. The Bureau of Internal Revenue has apparently never given a definite ruling applicable to members of the A. P. H. A., though in a recent letter to the associate editor, the bureau states that such deductions are not allowable.

In order to remedy this unsatisfactory situation, Senator Arthur R. Robinson of Indiana has introduced an amendment to H. R. 1, the Revenue Act of 1928. On page 19 of this measure one of the allowable deductions is for "traveling expenses (including the entire amount expended for meals and lodging) while away from home in the pursuit of a trade or business." Senator Robinson's amendment would add to this section the following: "or in attending meetings of trades or business organizations of which the taxpayer is a member." If this amendment is adopted, there would apparently be no question about these deductions, as they would have the sanction of law and the whims and vagaries of a bureau would no longer govern in the matter.

Federal Farms for Drug Addicts—Back in 1854, Dorothea Dix got a bill through Congress to set aside 10 million acres of public lands for the care of the insane. The measure was vetoed by President Pierce. A somewhat similar, though less lavish, project for the treatment of drug addicts has now been proposed by Representative Porter. His bill, H. R. 11192, calls for two federal narcotic farms to treat the drug addicts confined in federal penitentiaries. The proposed farms would care for 3000 prisoners. Among many other provisions, the Surgeon General of the U. S. Public Health Service would be required to examine each addict one month prior to his discharge in order to determine whether he had been cured.

Proposed Definition for Oleomargarine—Federal statutes now set forth the different fats and oils used in making oleomargarine and provide that these products are "oleomargarine" if made "in imitation or semblance of butter" or when so made are "calculated or intended to be sold as butter or for butter." According to Representative G. N. Haugen, who has introduced a bill, H. R. 10958, to amend the law, large amounts of fat compounds on the market are being sold without regard to the provisions of the law, as they are put up like butter in pound and even in parchment wrapped quarter pound packages, of a texture and containing moisture similar to that of butter. They also contain salt and some of them have artificial coloring matter, though labelled as "cooking compounds."

Careful research and tests on these products discloses, according to Mr. Haugen, that they do not contain milk or cream and were not mixed or churned

in milk or cream. The dairy and oleomargarine industries alike are stated to be of the opinion that these products are the potential subject of grave frauds. Mr. Haugen therefore proposes to add a third alternative to the definition of oleomargarine, as follows: "or (3) churned, emulsified, or mixed in cream, milk, water, or other liquid, and containing moisture in excess of 1 per centum." This, says Mr. Haugen, "makes a clear, plain, and honest definition, fats sold as fats left alone, fats made to imitate butter all put under the oleo law." A similar bill, S. 3247, has been introduced in the Senate by Senator Norbeck.

Oleomargarine colored in any manner would be subject to a tax of 10 cents a pound, according to an amendment to the Oleomargarine Act of 1886, introduced by Representative Linthicum as H. R. 11848. Mr. Linthicum is quoted as saying that the present law has been circumvented by the discovery of a yellow fat in old cattle which produces a yellow oil and when mixed with oleomargarine makes it look like butter.

Health of the Indians—Stating as one of the whereases that it is claimed that preventable diseases are widespread among the Indian population, that the death rate among them is not only unreasonably high but is increasing, and that the Indians in many localities are becoming pauperized, the Senate on February 2, 1928, adopted a resolution for an investigation of Indian affairs. The expenses, up to $30,000, are to be paid out of the contingent fund of the Senate.

Contact with the superior civilization of the white man has reduced the number of North American Indians from approximately 1,153,000 pure blooded aborigines to about 406,000, with a high percentage of mixed blood, according to a recent announcement of the Bureau of American Ethnology of the Smithsonian Institution. A series of great smallpox epidemics, beginning in 1637, seems to have been the greatest single factor, though war and fire water and other diversions and dissipations of the white race have also played their part.

Other Federal Legislation—A monument to the memory of Major General William Crawford Gorgas in the City of Washington is proposed in a joint resolution, S. J. Res. 92, introduced by the ebullient Senator Tom Heflin of Alabama. The President's physician is as far as ever from getting the rank of colonel, for Messrs. Blanton and two other earnest opponents objected in unison when the bill, H. R. 5658, for this purpose came up in the House on February 6, 1928. A most comprehensive bill, H. R. 10798, to regulate the practice of the healing art in the District of Columbia has been introduced in the House. Hearings on the bill, H. R. 5604, for more hospitals for veterans were concluded on February 4, 1928.

Damages for Typhoid—A claim for $5000 for damages and $1000 for expenses has been filed against the city of Cohoes, N. Y., by the father of a girl who contracted typhoid fever, according to *Health News* of New York for February 6, 1928. If the claims were not allowed, the father planned to bring action in court.

This case of typhoid is alleged to have been contracted from water supplied by the city to the home of the girl. The city is called grossly negligent in permitting polluted water from a canal to enter the city's mains through a cross-connection at an industrial plant. This is a violation of the State Sanitary Code. Forty-eight cases of typhoid fever were reported from the general vicinity of this cross-connection.

Court decisions in 8 states have determined that corporations, whether private or municipal, are liable for damages

for injuries or deaths due to typhoid fever caused by polluted water supplied by the corporation to individuals. Since 1910, considerably more than $50,000 in damages has been allowed by courts and many times that amount unquestionably has been paid in settlements out of court. A comprehensive article entitled, "The Liability for Water-Borne Typhoid," is scheduled for publication in the April issue of *Public Works*.

Milk Ordinance Upheld—Under its police power a city may require producers of milk sold in the city to comply with certain reasonable requirements, even though the dairies are outside the city limits. It is also proper to compel these producers to secure a license, and power may be delegated to the health officer to make inspections for this purpose. These and other important points were decided by the Supreme Court of Oregon in a recent leading case, Korth v. City of Portland, 261 Pac. 895.

The facts were that Korth and another dairyman brought suit to restrain the enforcement by the city of a comprehensive milk ordinance, which set forth the requirements for pure milk, provided for licensing dealers, and gave to the health officer the duty of making inspections. These dissident dairymen produced their milk outside the city limits on farms which they admitted did not comply with the requirements, and they sold it in Portland, though having no licenses.

The court held in the first place that the city could regulate the sale of milk within the city and thus the ordinance was not extraterritorial in scope. Although a state law prohibits a city from requiring licenses of peddlers of farm products produced from the soil, the court held in this case that the licenses were merely to cover the expenses of inspection and that such license fee is not levied for peddling. "It is a reasonable provision for the proper inspection and regulation of the sale of milk within the city. Those who are selling milk are required to register and pay a license, not because they are selling as peddlers, but to insure the proper regulation for the protection of the inhabitants of the city."

The contention that the power conferred on the health officer would allow him to base his requirements on personal whims and caprices was also dismissed by the court as untenable. The Legislature cannot delegate power to make a law, but it can make a law to delegate a power to determine facts upon which the operation of the law depends.

Good Advice from Indiana—A statement worth framing and hanging on the walls of the office of the health department occurs at the beginning of the red covered book of instruction to health authorities issued by the Indiana State Board of Health, of which Dr. W. F. King is secretary. This book contains the public health laws and regulations of the state. The good advice is as follows:

> Study the health laws and the health rules. Become familiar with your duties and powers. Don't hesitate or be timid about enforcing the health laws and rules for fear of making enemies. The honest, straightforward officer who enforces law will be respected and honored. If you permit a man to continue to violate the law which it is your duty to enforce, he will despise and ridicule you.

Medical Legislation of 1927—Fifty bills affecting medical licensure and the practice of the healing arts were introduced last year in the various state legislatures, according to a summary in the annual report for the year 1927 of the American Association for Medical Progress, Inc., of New York City. In the 44 state legislatures in session, various efforts were made to obstruct research and to undermine legal standards for medical practice. Attempts to prevent the use of dogs or other animals in medi-

cal research, made last year in New York, Maryland and Minnesota, were killed in committee. Efforts to change vaccination requirements in Massachusetts and New York also failed. Organized local efforts to have children immunized against diphtheria were met in some places with alarming stories of the disasters supposed to have resulted from the use of toxin-antitoxin. These attacks were successfully dealt with by local health officials who supplied the public with the facts.

Bills requiring that applicants for licenses to practice the medical arts be examined in the basic sciences were passed in Nebraska, Minnesota and Washington, though they were defeated in Colorado, Kansas and Oregon.

Miscellaneous—Nearly 20,000,000 cattle were under supervision and over 4,000,000 were on the waiting list for testing on January 1, 1928, in connection with the coöperative tuberculosis eradication work of the U. S. Department of Agriculture. During December, 1927, there were tested 935,984 cattle, and 18,966 reactors were found.

Present methods and administration of Federal Food Law enforcement are described by W. G. Campbell in the *American Food Journal,* January, 1928.

Rules for packing and labeling of edible oils were issued by the Federal Trade Commission on January 31, 1928.

A national electrical safety code has been issued as *Handbook No. 3* by the U. S. Bureau of the Standards.

A comfort station is not a nuisance *per se* and may or may not be such in fact according to circumstances. This is the holding in Zey v. Town of Long Beach, 258 Pac. 492.

The Iowa Supreme Court has held a town liable for polluting a stream. Stovern v. Town of Calmar, 216 N. W. 112. This is settled law.

CONFERENCES

April 12-14, American Society of Biological Chemists, Inc., Ann Arbor, Mich.

April 12-14, Federation of American Societies for Experimental Biology, Ann Arbor, Mich.

April 28, National Research Council, Washington, D. C.

April 30-May 2, American Pediatric Society, Washington, D. C.

April 30-May 2, National Probation Association, Memphis, Tenn.

April 30-May 5, National Congress of Parents and Teachers, Cleveland, O.

May 1-2, American Association of Pathologists and Bacteriologists, Washington, D. C.

May 2-9, American Association for Organizing Family Social Work, Memphis, Tenn.

May 10-12, American Association of Hospital Workers, Memphis, Tenn.

May 23, American Climatological and Clinical Association, Washington, D.C.

May 23-26, American Physical Education Association, Baltimore, Md.

May 28-June 2, American Library Association, West Baden, Ind.

May 28-June 7, General Federation of Women's Clubs, San Antonio, Tex.

June 4-9, Biennial Nurses Convention, Louisville, Ky. (American Nurses Association, National League of Nursing Education, National Organization for Public Health Nursing)

July 8-12, Congrès International de la Protection l'Enfance, Paris, France.

July 8-13, First World Congress of Social Workers, Paris, France.

July 16-21, Thirty-ninth Congress Royal Sanitary Institute, Plymouth, England.

October 15-19, American Public Health Association, Chicago, Ill.

BOOKS AND REPORTS

USEFUL BOOKS OF THE PAST YEAR

M. P. RAVENEL, M.D.

"OF THE making of books there is no end." During the past year there has been a great flood of books, bearing more or less directly on the teaching of public health. For the benefit of those who are trying to keep up with the advances in public health, we are making an attempt to note briefly the most important books published or reviewed during the past year. Most of these have been selected from the notices in our own JOURNAL, though a number of other leading journals have been consulted freely. We have avoided mentioning new editions, only one exception having been made.

FOR those who have not the time to read their way through mountains of books, even on public health subjects, this bird's-eye view of some of the peaks will serve as a welcome guide. It should not be considered as a detailed chart—not every good book could be mentioned even briefly. However, to help in selection, something good is listed in every major field covered by the public health compass.

Specialism has reached even into public health, so the books are grouped loosely into classes. Strict classification is impossible in many cases. Practically all books on hygiene properly give more or less attention to anatomy and physiology, but authors vary in this respect.

Among those in which the body and its functions are primarily considered, may be mentioned *The Human Body*, by Trevor Heaton, E. P. Dutton & Co.; *The Normal Chest of the Adult and the Child*, by J. A. Myers, Williams and Wilkins Co.; and *The Human Body*, by Marie C. Stopes, G. P. Putnam's Sons, and *The Human Body*, by Logan Clendening, Alfred A. Knopf, Incorporated.

In these days when athletics, especially the intercollegiate form, have become so unduly emphasized, the book, *Heart and Athletics*, by Deutsch and Kauf, translated by Louis M. Warfield, C. V. Mosby & Co., is very timely.

Biographies are always interesting, and no student should miss the opportunity of studying the careers of those who have helped to make science what it is. The following books deserve especial mention: *Life and Work of Sir Patrick Manson*, by Philip H. Manson-Barr and A. Alcock, Wm. Wood & Co.; *Lister As I Knew Him*, by John Rudd Leeson, Wm. Wood & Co.; and *Interpreters of Nature*, by Sir George Newman, Oxford University Press. The one by Sir George Newman contains a number of sketches, biographical and historical, written in an especially interesting style.

The relation of the lower forms of life to disease is constantly attracting more attention. Three books may be mentioned in this connection: *The Biology of the Protozoa*, by Gary N. Calkins, Lea & Febiger; *Host-Parasite Relations Between Man and His Intestinal Protozoa*, by Robert Hegner, Century Co.; and *Protozoology*, by C. M. Wen-

von, Wm. Wood & Co. The last mentioned book is encyclopedic, and its cost is prohibitive to the average man, but every library should have it.

Cancer Control—Report of Symposium at Lake Mohonk, contains material with which all should be familiar.

Carriers are always with us, and we can recommend *The Carrier Problem*, by K. C. Paul, Oxford University Press.

We have frequently commented with approval on the increasing recognition of the importance of oral hygiene. In this field we find: *Pyorrhoea Alveolaris*, by F. St. J. Steadman, C. V. Mosby Co.; *Diseases of the Mouth*, by Sterling V. Mead, C. V. Mosby Co.; and *Dental Education in the United States and Canada*, Carnegie Foundation.

Need for Eugenic Reform, by Leonard Darwin, D. Appleton & Co. is easily the best book which has recently appeared on this important subject.

History is represented by *Peaks of Medical History*, by Charles L. Dana, Paul B. Hoeber, Inc.; and *Introduction to the History of Science*, by George Sarton, Williams & Wilkins Co. The latter is an encyclopedic source book, running from the time of Homer to that of Omar Khayyam.

Professor E. O. Jordan has given us an excellent work, *Epidemic Influenza*, published by the American Medical Association Press, which is a digest of all obtainable literature dealing with the etiology and epidemiology of this disease, which apparently has come to stay with us. In the recent past it has caused the greatest number of deaths throughout the world of any diseases known in history, with the exception of plague.

Several laboratory manuals have appeared, most of which are good, but the large volume, *Standard Methods*, by A. B. Wadsworth, Williams & Wilkins Co., is outstanding. This gives detailed descriptions of the methods in vogue at the New York State Laboratory, of which the author is director.

Hygiene is an all-embracing term, though several clear divisions are recognized. The book *Hygiene*, by Florence Lyndon Meredith, P. Blakiston's Sons, approaches the subject from a number of different standpoints, and is offered as a textbook for students with limited scientific background.

Industrial hygiene, which is assuming a proper place in our program, is well represented by *Personal Health*, by E. R. Hayhurst, McGraw-Hill Book Co.; *Advising the Tuberculous About Employment*, by Hamilton and Kidner, Williams & Wilkins Co.; and *Medical Care of Industrial Workers*, National Industrial Conference Board. For school hygiene, another most important division, we can recommend especially *Fundamentals of School Health*, by James Kerr, MacMillan & Co., which in our judgment, is easily the best single volume that has been written on the subject, and is encyclopedic in character.

Other excellent books are *Health Behavior*, by Wood and Rowell, Public School Publishing Co.; and *Health Supervision and Medical Inspection of Schools*, by Wood and Rowell, W. B. Saunders & Co. Deserving particular mention is the *Handbook on Positive Health*, by several authors, edited by Lenna L. Meanes, Women's Foundation For Health, New York, N. Y. This is a book on personal hygiene, designed especially for women. *Hygiene and Sanitation*, by Jesse Feiring Williams, W. B. Saunders & Co., is an excellent presentation of the subject. An outstanding book in this division is *International Hygiene*, by C. W. Hutt, Methuen & Co., which speaks in international terms, and gives the average reader an entirely new view of the subject. Mental hygiene, a subject which the average health officer and physician have left too much to the specialist, is well represented by *Everyday Problems of the Everyday Child*, by Douglas A. Thom, D. Appleton & Co.

Two excellent books on nutrition, another subject of surpassing importance which is now attracting general attention, are *Your Weight and How to Control It,* edited by Morris Fishbein, G. H. Doran & Co.; and *The Foundation of Nutrition,* by Mary Swartz Rose, MacMillan & Co.

Vaccination against smallpox is considered in an historical scientific survey of the question called *Should We Be Vaccinated?* by Bernhard J. Stern, Harper & Bros., which should convince anyone of the value of the procedure.

The matter of sewage disposal is inseparably connected with the purity of drinking water. A new volume, *Solving Sewage Problems,* by Fuller and McClintock, McGraw-Hill Book Co., is excellent. A second book on this subject, more suitable for the engineer than for the average reader is *The Activated Sludge Process,* by Arthur J. Martin, McDonald & Evans, London.

Two books on the subject of water and its purification are *The Microscopy of Drinking Water,* by George Chandler Whipple, John Wiley & Sons; and *Studies of the Efficiency of Water Purification Processes,* by H. W. Streeter, U. S. Public Health Service. The former of these is a new edition, and is mentioned here because the author is no longer living, and the present volume, edited by his son and others, contains much new material.

While not strictly relating to public health, as such, two books on tuberculosis should be mentioned: *Getting Well and Staying Well,* by John Potts, C. V. Mosby Co.; and *Tuberculosis: Bacteriology, Pathology and Laboratory Diagnosis,* by Baldwin, Petroff and Gardner, Lea & Febiger. The latter is the result of years of experiencee at Saranac Lake and gives new methods due to Petroff.

It has frequently been pointed out that if we could apply what we already know, life could be made happier and greatly lengthened. The American Public Health Association has for several years past given much attention to the administrative aspect of public health, and as the result, can now offer *Community Health Organization,* edited by Ira V. Hiscock, which contains revised plans for communities of 100,000 and 50,000 inhabitants, and a new plan for cities of 30,000. Closely allied to this subject are *City Health Administration,* by Carl E. McCombs, MacMillan & Co.; *Municipal and Rural Sanitation,* by Ehlers & Steel, McGraw-Hill Book Co.; and *Clinics, Hospitals and Health Centers,* by Michael M. Davis and others, Harper & Bros.

Some other useful books for general reading are: *Health Problems in Organized Society,* by Sir Arthur Newsholme, P. S. King & Co., London; *Problems of Social Well-Being,* by James H. S. Bossard, Harper & Bros.; and *American Medicine and the People's Health,* by H. H. Moore, D. Appleton & Co. The titles of these books give some idea of their contents. The last is written from the economic standpoint and is a comprehensive review of the cost of medical care and its relation to the public. It has had much to do with the appointment of a committee which is now making a study of this subject. A book which is especially suited to the laity is *Triumphs of Medicine,* by H. S. Hartzog, Doubleday, Page & Co., which tells in non-technical language many of the good things which scientific medicine has accomplished.

Most of our readers are aware of the numerous attempts which have been made for some years past to reorganize the departments of our government in Washington, there being, at present, upwards of forty bodies which deal more or less directly with medicine and public health. Two books give facts along this general line: *Federal Health Administration in the United States,* by Robert D. Leigh, Harper & Bros., and *National*

Government and Public Health, by J. A. Tobey, Johns Hopkins Press.

Advancement in medicine, curative as well as preventive, depends upon research, and since the anti-evolutionists and opponents of science generally are busy, we recommend for general reading, *The War on Modern Science,* by Maynard Shipley, Alfred A. Knopf.

We have made no attempt to include books in foreign languages. Anyone interested will find a number of them reviewed in our columns, as well as in those of other journals. We believe that the majority of our readers are more interested in books using their mother tongue and feel sure that anyone who carefully reads those which have been mentioned will be fairly well posted on hygiene and public health.

See Announcement of New Books on pages XXVI–XL

The Human Body—*By Logan Clendening, M.D. Illustrations by W. C. Shepard and Dale Beronius and from photographs. New York: Knopf,* 1927. xxii + 399 pp., 102 figs. Price $5.00

Medical information has often been regarded as the peculiar property of the physician, to be jealously guarded by a screen of classic verbiage and hidden under the camouflage of technicalities. Education in medical matters was to be gotten only along the arduous and closely guarded route of premedical, preclinical, clinical, and postgraduate years of intense and sustained study. However, the development of the modern sciences tributary to medicine and the advances in the arts of medicine and surgery have now attained such a unification and precision that a presentation primarily for the unprofessional but inquiring reader is both opportune and welcome.

Dr. Clendening's *The Human Body* meets this need. It is first and last an epitome on medical knowledge, with just enough anatomy and physiology to enable the reader to comprehend the normal body in health, whose disorders in disease and old age are the main theme of the work.

The treatment is refreshingly frank and not a few medical idols of confiding patients are tumbled off their pedestals. The natural powers and resources of the body, its own defensive mechanisms, its normal progress into the inevitable stages of senescence emerge ever and again in the discussions of disease and its prevention or cure. It is not, however, intended as a first aid till the doctor comes or a compendium of diagnosis and home treatment, but rather as a background of information on the organ systems in health and in disease which will help the intelligent inquirer to cooperate more effectively with his physician—this in spite of the author's defense of lying to his patients about their true condition.

The discussions of inoculation and vaccination are peculiarly interesting to public health workers, especially the reproduction of the cartoon of 1802 exhibiting the dire results of "cow pock inoculation" in the form of bovine heads and horns growing out upon the terrified victims.

The author is wholly "sold to the idea" of the baneful and all but omnipotent effects of heredity—perhaps a deal more than even the geneticists themselves would admit, as for example with reference to the victim of baldness he says: "He may be sitting in chairs with snake oil and violet lamps playing all over his head, when the only way to cure his baldness would have been to castrate his grandfather."

Possibly the author's amply exhibited antipathy to all forms of social control—except in the matter of vaccination—is back of his rather unguarded statements about syphilis, which he says "has a very hard name—a much worse one than it deserves. It is, after

all, not such a very dreadful disease." He then proceeds to enumerate its disastrous effects, and concludes with the only prescription in the book!

The illustrations are new and they really illustrate in an illuminating fashion. They are often diagrammatic and very clear with the accent on the important features. Those of historical incidents are particularly well chosen and well conceived.

The fact that the author at times lapses into characteristic Baltimorean Menckenese, especially when he recalls Volstead and vies with Schopenhauer in his view on marriage and its dire consequences may charm some of his readers—but not all of them, for he will have many. In spite of these distractions, the main theme is diseases exposed to public view and its story dramatized, possibly even over-emphasized at times, but always quite readable and informing.

CHARLES A. KOFOID

Modern Methods of Testing Milk and Milk Products—*By Lucius L. Van Slyke.* (3rd ed.) *New York: Orange Judd Pub. Co.* 1927. XII + 344 pp., 53 figs. Price, $2.00.

Earlier editions of this book issued in 1906 and 1912 have found a wide use and it seems probable that this completely revised new edition will prove equally useful. The title is somewhat misleading in that the common chemical and physical methods of examining milk are the only methods discussed in detail. After a chapter on the chemistry of milk and one on methods of sampling and of preserving samples for the fat test, five chapters are taken up with a discussion of the Babcock fat test in its various applications and a later chapter (XVI) returns to the same general theme. The Roese-Gottlieb method is given as a means of checking the accuracy of the Babcock test.

Other chapters discuss methods of determining water in butter and cheese, salt in butter, acidity in milk and milk products. Various simple biochemical tests and methods of testing milk by rennet extract and pepsin are taken up in the next two chapters, followed by a discussion of methods of determining specific gravity, total solids, casein and adulterations. The two chapters on methods of commercial testing, scoring and grading butter, cheese, milk, cream and ice cream are useful but show less familiarity with the latest developments, particularly in the field of grading market milk.

The final chapter giving examples in the arithmetic of milk and milk products helpful to practical workers is followed by an appendix which gives the specifications of standards for the glassware used in the Babcock test drawn up by the Association of Official Agricultural Chemists and the American Dairy Science Association. The United States Government definitions and standards of purity for milk and milk products are also included.

An interesting personal touch is given the book by a frontispiece showing Dr. Stephen M. Babcock, the originator of the fat test that bears his name, reading a fat test in his laboratory. Dr. Babcock's active life spans practically the whole of the experiment station movement in America as he began his work at the New York State Station at Geneva before the Federal Experiment Stations had been established in all of the states. Removing within a few years to the Wisconsin Station where he has since remained, his place was soon taken at the New York State Station by Dr. L. L. Van Slyke. Some of the tables given in this book are those prepared by Dr. Van Slyke in his early work with the Babcock test. These figures still remain the most accurate and comprehensive figures that have been secured for showing the fat present in the milk of various breeds of dairy animals.

R. S. BREED.

Food Infections and Food Intoxications—*By Samuel Reed Damon, A. M., Ph.D. Baltimore: Williams & Wilkins*, 1928. 266 pp. Price $4.00.

This is a reference book which is addressed to food chemists, bacteriologists, physicians and nutrition experts and deals with cases in which food acts as the vehicle by which the infectious agent or toxic material is disseminated. A part only of that limited field is covered as the author narrows his discussion to those diseases in which the transmission of the infectious or toxic substance takes place, as a rule, only through the medium of food. This results in the exclusion of such matters, as for example the transmission of typhoid by shellfish.

In discussing each form of infection or intoxication, the author has presented in considerable detail the phases of etiology, symptomatology, diagnosis, treatment and prophylaxis.

In the introduction to the book there is a short dissertation on the discarded theory that ptomains cause food poisoning. This might well have been amplified in view of the fact that so many otherwise well informed persons, including physicians and health officers, still persist in seriously giving "ptomain poisoning" as a cause of sickness and death.

The book is divided into three parts. Part I contains chapters on para-typhoid infections from food, tuberculosis from milk and meat, undulent fever from milk, septic sore throat from milk, and actinomycosis. Part II contains chapters on botulism, mushroom poisoning, grain intoxications, milk sickness, potato poisoning, and fish and shellfish poisoning. Part I deals with the ingestion of microörganisms capable of elaborating toxins within the human or animal body. Part II deals with the ingestion of preformed toxins.

While the text is well worded, interesting, and easily read and while the discussions of symptomatology and diagnosis are, in particular, ably presented, Parts I and II, on the whole, leave a distinct sense of incompleteness. This is not entirely due to the limitations which the author deliberately adopted. Another reason will be sensed from the fact that of 326 references to literature, there are none to work published in 1927, and only 2 and 3 respectively to work published in 1926 and 1925. The chapter on undulant fever is lamentably out of date and presumably was so even before it was printed. It is based on goat's milk, and leaves untouched the highly important matter of cow's milk. A small, but by no means negligible, part of the material in the book appears to be vague and inconclusive, as for example, the evidence presented to support the section on "Poisoning from fish containing a poisonous principle of bacterial origin."

Part III, regarding Zoo-Parasitic Infections acquired through Food, contains chapters on human infection with animal parasites, trichinosis, taeniasis, other parasites of man acquired through food, and diagnosis of helminth infestation, and was written chiefly by Norman R. Stoll, as appears in a rather inconspicuous footnote. This part of the book is distinctly up to date. Of 89 references which it makes to published literature, 1 is for 1927 while 14 and 7 respectively refer to articles which appeared in 1926 and 1925. It contains material of interest and value which, being in such a specialized field, might not otherwise be located by many readers. It is concise, well written and distinctly worth while, even though much of the material may be considered to be chiefly of academic interest in this country.

The proof reading of the book was not perfect by any means. Five typographical errors were noted, of which one, on page 255, naming a specific gravity of 1:200 might be confusing to some readers. The print is clear, the illustrations generally good and the binding is strong.

H. W. REDFIELD

International Hygiene—*By C. W. Hutt, M.D., D.P.H. London: Methuen & Co. Ltd.*, 1927. 261 pp. Price $3.00.

The author has given us a book entirely unlike most works on hygiene, and one of unusual value. It is true that he writes largely from the standpoint of a comparatively small island country, which is dependent to a great extent upon other parts of the world for its food supply. On account of the enormous shipping interests of England, maritime quarantine perhaps plays a larger part in the protection of that country than of any other, though it is everywhere an important factor. In America it is now entirely under the U. S. Public Health Service, but only a few years ago certain ports and states maintained their own quarantine.

The chapter on International Sanitary Conventions would be interesting under any circumstances, but its significance has been tremendously increased by the introduction of steam vessels and the airplane.

Another question of great international importance is discussed in a chapter under Drug Habits, which gives a rational discussion of one of the most vexed questions with which the public health officer has to deal. Three topics of international interest are Emigration and Immigration, Venereal Disease, and the Health of Seamen, to each of which a chapter is devoted. Industrial Hygiene, as an international question, affects the people of this country chiefly in the importation of hides and fleeces.

About one-third of the book is given to Voluntary Aid, such as the Red Cross, in public health, and the Medical Work of the League of Nations, the latter of which takes into consideration also the Office International located in Paris, and its predecessor, which rendered such valuable assistance to many nations.

The author has given us a volume of great value which should teach us to think of health internationally. The make-up of the book is excellent and it is written in such an interesting style that one finds it hard to put it down. It can be recommended to all health officers, particularly to those at ports of entry, but can be read with great advantage by sociologists and all others who are interested in the advancement of public welfare. M. P. RAVENEL

Health Hero Series. 1—Louis Pasteur, 2—Edward Jenner, *By Grace T. Hallock and C. E. Turner. New York: Heath.* 1928. 238 pp. and 204 pp. Price, $1.12 each.

The narrative of modern public health can best be told in a series of biographies, for the story of health is the story of men. The recital of the notable events which have resulted in the conquest of disease is, furthermore, particularly suitable for schoolroom use, for in studying the lives of the heroes of health, the youth of the nation receive inspiration as well as instruction. They will get both from these two excellent books, which are fortunate in having as their authors, a trained writer interested in science and a capable scientist.

No more fitting subject could have been chosen to inaugurate this series than the career of the founder of preventive medicine, while that of the first protagonist of vaccination is an acceptable second. This biography of Louis Pasteur is concise, yet complete, and all of the notable episodes in the life span of the eminent scientist are arrayed before the reader. Even the mature sanitarian who desires a succinct account of the greatest of his predecessors in the field of public health could read this little volume to advantage.

The story of Pasteur is more humanly told than is that of Jenner. At times the latter becomes somewhat detailed and often it is a tract on vaccination. This, of course, is not objectionable, except to the ubiquitous anti-vaccinationist, who may fume over it, and the book is packed

with useful information about this one certain preventive of smallpox. The life of Jenner obviously could not be as dramatic as that of Pasteur, for Jenner made only one noteworthy contribution to human progress, whereas Pasteur gave us many.

These two books can be highly recommended for the purpose for which they are designed, as school textbooks. They are attractively and profusely illustrated and printed in a flawless manner. There is a good index in each. It is to be hoped that more books of a similar nature will be forthcoming from the same or equally gifted authors. JAMES A. TOBEY

Your Weight and How to Control It, *A Scientific Guide by Medical Specialists and Dietitians—Edited by Morris Fishbein, M.D. New York: George H. Doran,* 1927. 260 pp. Price $5.00.

This book is the outcome of the first Adult Weight Conference, which was attended by 22 physicians and dietitians. It consists of two parts, the first of which is made up of a series of articles which were printed in the *Sunday Magazine* of the *New York Herald Tribune*. The second part gives the Principles of Nutrition, with a series of diets and menus for gaining or reducing weight respectively.

The keynote of the book is that normal weight is closely related to health. The modern craze for reducing is hard-hit in a series of papers showing the irrational ideas held by the majority of people. The effect of reducing irrationally and to too great an extent is discussed from various standpoints, including the nerves, tuberculosis, skin, etc. The dangers of beauty operations and removal of fat are shown, and the many widely advertised mail-order fakes are adequately discussed.

Approximately one-half of the book is given to a clear discussion of the principles of nutrition. A large number of diets, menus and weight tables are included. The tables give one hundred calorie portions, both in measurements such as the ordinary person uses—tablespoons, cups, etc.—as well as their weight. These weights are apparently given in ounces, though there is no statement to this effect, an omission which should be corrected.

The book deserves a longer review, but the number of authors and contents render this difficult. We can only say further that it is by far the most useful book on this subject for the average reader with which we are acquainted, and we wish for it a wide circulation. It is well printed on light paper with a mat surface, rather a rare occurrence for a book published in America.

M. P. RAVENEL

A Son of Mother India Answers—*By Dhan Gopal Mukerji. New York: Dutton,* 1928. 112 pp. Price $1.50.

Mother India was a book of horrors, for which the only excuse could have been a desire to better conditions. The present book has what Miss Mayo's book often lacked, exact references to official documents, which we are compelled to believe disprove many of the statements made in *Mother India*.

The author charges Miss Mayo with misunderstanding, with selecting isolated cases, with suppressing facts which she could have easily ascertained, and even with "untruthful invention." A number of the statements in *Mother India* seemed unbelievable, even before this refutation was published. The authoress is likened to a drain inspector who concludes that the drains are the country. There are also statements from English physicians and from missionaries who assert unhesitatingly that the picture of India given by Miss Mayo is untrue and unjust. One of the worst abuses, the author shows to be due to British official votes. He even shows that one British clergyman voted against one of the reforms, even as late as 1926.

The book on the whole is temperate in tone, especially the latter part of it. The author does not pretend that some reform is not needed in India, but he shows quite plainly that it is somewhat absurd for an American to criticise certain Indian customs, even if they were correctly given. The book closes with several appendices which throw further light on the subject under discussion. Miss Mayo's book excited more than usual attention, which the author characterizes as "a sad commentary on western literature and culture," and we recommend this answer to all who are interested in fair dealing and in the betterment of conditions in India.

M. P. RAVENEL

Playgrounds of the Nation—*By Florence C. Fox, Bull. No. 20. Washington: Dept. of the Interior, Bureau of Education,* 1927. 99 pp.

That teachers of civics, geography, nature study, history, and arts and crafts can draw upon the state parks and forests for interesting classroom material is proved by the facts offered in this pamphlet. The text is interesting and the book is profusely illustrated.

Mosquito Surveys. A Handbook for Anti-Malarial and Anti-Mosquito Field Workers—*By Malcolm E. MacGregor, M.A. New York: Wood,* 1928. 203 pp. Price $5.50.

This 203-page book is described by the author as a handbook for anti-malarial and anti-mosquito field workers. In a broad sense it can hardly be classed as such as it is decidedly limited in information relative to anti-mosquito control measures. In this treatise the author has reported in detail, his investigations on the biology and bionomics of mosquitoes (especially Anopheles) of the Island of Mauretius in the South Indian Ocean, about 500 miles east of Madagascar.

The book is arranged in three parts. The first is devoted to a primary classification of mosquitoes, the anatomy of the egg, larva, pupa and adult, together with their life history and characteristics. There are many interesting line diagrams illustrating this section. Part II is given over to a classification and description of the mosquitoes of Mauritius and Rodriquez. In Part III the author describes laboratory and field technic for the entomologist and field work on mosquito control and research activities.

The treatise is a valuable contribution and commends itself to all interested in mosquito control work. It is to be hoped that in later editions the author will add a fourth part devoted to practical information and reports on mosquito control methods.

ARTHUR E. GORMAN.

Physical Chemistry and Biophysics—*By Matthew Steel, Ph.D. New York: Wiley,* 1928. 372 pp. Price $4.00.

This book is designed to fill a real need, namely, a text of physical chemistry designed for students of biology and medicine. On the whole it is carefully written, though it seems a bit wordy. Especially Chapter II, on the "Nature and Structure of Matter," seems to contain much material which, considering the present state of our knowledge, might well be omitted. The chapter on "Diffusion and Osmotic Pressure" is better than those found in many elementary books. The treatment is somewhat vague in places, but at least it is not incorrect. The section on "Emulsoids," pages 282 to 310, follows very closely the treatment given by Jaques Loeb.

The fundamental objection to the book as a text in this particular field is the absence of numerical problems. Otherwise it seems to cover the subject completely, fairly accurately and quite lucidly, and it is hoped that in a later edition the lack of numerical problems may be remedied.

ALLEN E. STEARN

Lister As I Knew Him—*By John Rudd Leeson, M.D., C.M. (Edin.) M.R.C.S. New York: William Wood,* 1927. 212 pp. Price, $3.50.

The Life of Lord Lister, by Sir Rickman Godlee, will, we believe, always remain the classical work on this great man. However, several shorter books have appeared giving more intimate stories of him as a man, as well as a number of articles, some of which have been reviewed in these columns, and all of which have brought us into closer contact with Lord Lister than the classic mentioned above. Among the shorter books, that by the present author is easily the best. After observing something of Lister's work at Edinburgh, he began as a dresser for him, then became surgical clerk, and remained always a great admirer and friend.

Some very striking contrasts are brought out. Dr. Leeson began his studies in St. Thomas's Hospital, which was in a new and airy situation on the Thames Embankment, where there was much more sunlight than is usual in the City of London. The buildings and apparatus were entirely new, and the hospital was the first to be built on the pavilion system, while the nurses belonged to the institute started by Florence Nightingale. The staff was made up of many of the most noted men in England; yet we are told, "so far as surgery was concerned . . . . the old enemies pyemia, septicemia and erysipelas were as rife as ever," though they were generally attributed to overcrowding and dirt. On the advice of Murchison, Dr. Leeson went to Edinburgh where he was greatly distressed by the appearance of Lister's wards. They were gloomy, forbidding and overcrowded, but to his astonishment, he found that the patients were free from pain and cheerful, that there was little suppuration of wounds, none of the dreaded pyemia so common at that time, and that many of the patients seemed to remain in bed only because there was nowhere else to put them. It soon became apparent to him that Lister's antiseptic treatment, combined with the individual care given to each patient, was the secret of the unusual results.

There is much history in the book, especially concerning the development of antiseptic surgery. The intimate history given of Lord Lister is particularly interesting, and the book fascinates one more than does the larger work of Sir Rickman Godlee.

Some three pages are given to "Aphorisms and Precepts," most of which the author believes were original, but as he says, Lord Lister constantly told his students that this or that was "learnt from Mr. Syme." If the book contained nothing else than these sayings, it would be well worth reading.

It is written in a most fascinating manner, contains numerous interesting illustrations, and is well printed on light paper. We cannot do better than to close by a quotation which contains really the meat of the whole book: "Transcendent as were his epoch-making discoveries, the man was more than the message."

M. P. RAVENEL

Infectious Diseases and Aseptic Nursing Technique—*D. L. Richardson, M.D. Philadelphia: Saunders,* 1927. 182 pp. Price, $1.50.

In the first part of the book, one gets a clear cut picture of each communicable disease from the medical aspect—etiology, period of incubation, symptoms and signs, complications, prognosis, and treatment. There is no discussion of the nursing care of the patient in relation to the course of the disease nor of the treatments carried out by the nurse. The diseases are considered with very little reference to community health and to the need for public health education in relation to the prevention and control of communicable diseases, and to the part the nurse plays in this education.

Measures of disease control in home

care of the sick are treated in a general way in one chapter at the close of the discussion of the 28 diseases, but the treatment of these measures lacks the particular applications of principles that would make such a book very valuable.

In the second part, there is an excellent description of the nursing technic carried out in the disease-unit system as practiced in the Providence City Hospital. This detailed account of aseptic procedures would be very useful to anyone who was about to set up this particular technic.

Dr. Richardson's book is very useful as a reference book for the medical aspect of communicable diseases and for one particular type of aseptic procedure in the care of communicable diseases.

OLIVE A. ALLING

Freshman Hygiene. Personal and Social Problems of the College Student—*By Raymond C. Bull, M.D., and Prof. Stanley Thomas, Lehigh University. Philadelphia: Lippincott,* 1926. 288 pp. (ill.) Price, $2.00.

This book is the outgrowth of extended experience with college freshmen in an attempt to build up the health service on a solid foundation of theory and practice. The text apparently presupposes a perfect blank in the mind of the student so far as concerns any organized knowledge about that portion of the universe which is sometimes called "living." The style does not assume too much in the way of intellectual capacity and may therefore indicate, much as we hate to admit it, that the average intellectual level of college freshmen is lower than is commonly supposed. Two-thirds of the book contains some twenty chapters on the usual topics taught in the high schools under the name "Physiology and Hygiene," and is on the whole sound in its information and in its counsel. The last third of the book, under the title "Social Hygiene," is made up of a dozen chapters on reproduction, the venereal diseases, and "Civic Aspects of Social Hygiene."

The distribution of the material gives the impression that those in charge of the instruction have not yet sufficiently mastered either the technic of instruction, nor the technic of handling the students so as to integrate the information and the guidance which they offer in a manner calculated to help the student organize his own experience most effectively.

While the contents are on the whole quite acceptable—and quite within the comprehension of high school students, there is a certain formality and there is a certain dogmatism which suggests the need for a more thorough study of the problem of health education from the point of view of modern psychology and pedagogy.

This book should be of great help in institutions which have to rely upon the book for introducing the student to habits, to attitudes, and to information which ought normally to have been assimilated before college age is reached.

B. C. GRUENBERG

Cleanliness and Health—*By Turner and Collins. New York: D. C. Heath and Co.,* 1926. 263 pp. Price, $.88.

This is the second book resulting from the authors' studies and experimental work in health education in the elementary and junior high school grades of Malden, Mass. The reasons for practicing health habits and acquiring health knowledge are carefully set forth from a physiological and biological basis. It is not a text on physiology, but gives a sufficient introduction to the subject in order to make clear the basic reasons for healthful living.

A considerable part of the book is devoted to a discussion of cleanliness in relation to bacterial life as found in soil and dirt, and the prevention of infections. It defines cleanliness as the ab-

sence of dirt, and incidentally of bacterial life. Molds, bacteria, and yeast are described and illustrated, and the work of Jenner and Pasteur briefly told in relation to the origin of vaccination and the science of bacteriology.

Certain important parts of the body, such as the teeth, stomach, intestinal tract, lungs, and the skin are described and illustrated. The prevention of dental decay, the health of the digestive tract and the skin, the prevention of colds, and the control of typhoid fever and tuberculosis are carefully discussed. One chapter is devoted to the care of foods, and another to the harmful effects of alcohol and tobacco.

The book is an excellent text for health instruction in the upper grades and junior high schools, and should be a good guide for teachers who do not depend upon a textbook in the classroom. It is an excellent introduction to a more advanced study of physiology. The book is splendidly written and the material scientifically accurate. Teachers in the upper elementary grades and junior high schools will welcome it.

WILLIAM DEKLEINE

Noxious Gases and the Principles of Respiration Influencing Their Action—*By Yandell Henderson and Howard W. Haggard, New York: Chemical Catalog Co.*, 1927. 212 pp. Price, $4.50.

This book represents a rather novel departure from the usual method of treatment of the subject of poisonous gases. It has generally been the practice to approach this subject from the point of view of the pharmacologist. In the present instance, however, the subject has been approached from the point of view of the physiologist, and Drs. Henderson and Haggard have brought their wide experience in the field of respiratory physiology to bear on this very important problem. The result has been an exceedingly valuable contribution.

The first three chapters are devoted to a general survey of the field and to a discussion of the basic elements of respiration and its control. A chapter deals with the various physical laws relating to gases and vapors. The absorption, distribution and elimination of volatile substances are discussed in a general way. The various types of noxious gases are considered, and prevention and treatment of poisoning are treated.

There has long been a need of a book such as the one under discussion, for here instead of considering the gases from their chemical viewpoint they are regarded and classified from the point of view of the action which they bring about in the human body. Accordingly, the gases have been classified as asphyxiants, irritant gases, volatile drugs and drug-like substances, and inorganic and organo-metallic gases. In each group the various gases are rather completely discussed from the point of view of toxicology with tabulations showing the various physiological and toxicological effects as obtained from the literature. With the exception of benzol the discussion seems to be admirably handled. In the case of this substance, however, it would appear that the authors have failed to make complete use of the report which was recently published by the National Safety Council.

Each chapter closes with a bibliography of pertinent references.

LEONARD GREENBURG

Body Build: Its Development and Inheritance—*Bull. No. 24 Eugenics Record Office—By C. B. Davenport. Cold Spring Harbor, N. Y.*: 1925. 42 pp.

This pamphlet is an abstract of a volume of the same title, Publication No. 329 published by the Carnegie Institution of Washington. This abstract has been prepared so that the study contained in the original volume will be available more easily for students and workers in the field of eugenics.

Some Administrative Aspects of Scarlet Fever—*Reports On Public Health and Medical Subjects No. 35. Being a report on current English public health practice in the control and treatment of Scarlet Fever, prepared by Allan C. Parsons, M.R.C.S., with the assistance of a Committee of Medical Officers of the Ministry of Health, from materials furnished, in large part, by Medical Officers of Health and Superintendents of Isolation Hospitals.* London: Published by His Majesty's Stationery Office, 1927. 368 pp. Price, $1.80.

This report shows the thoroughness with which the English are accustomed to study things, and the conclusions are characteristically conservative. The meat of the whole report is summed up in the prefatory note by Sir George Newman.

Neither the cause of nor immunization against scarlet fever is considered, though the opinion is expressed that "immunization, natural or acquired, is the biological answer to disease."

The minimum period of detention varies in the sixty hospitals investigated, from 28 to 42 days, though the Metropolitan Asylums Board seems to favor a longer period. In Brook Hospital, 67 days was the average in 1924. The tendency in America, especially since antitoxic serum has come into use, is to shorten this period. The English board concluded that as a routine procedure, 4 weeks for uncomplicated cases was long enough. In other cases, the period of detention must be determined by the presence of discharges, general health, etc. The board does not regard the discharge of patients in the late stages of desquamation as a danger to public health.

In England the detention hospitals are overcrowded, and it is believed that too much space is taken up with scarlet fever. From 1917 to 1926 inclusive, there were only 10,672 deaths from scarlet fever, though during the same period, there were 58,292 deaths from measles, 392,942 from pneumonia, and 13,645 from epidemic diseases affecting the central nervous system. It is clear that the old dread of scarlet fever still affects the public as well as the medical profession. These considerations have led to a study of home treatment, and the board concludes that the latter has not received the attention which it deserves.

Terminal disinfection has been discontinued by certain officers, and it is shown, quite conclusively we think, that neither disinfection by steam nor fumigation, nor a combination of the methods, has any value in lessening the number of secondary cases. Fairly extensive studies have shown that hemolytic streptococci are found in the throats of many patients and may retain their vitality under conditions simulating those of the sick room for 50 days. It is pointed out, however, that scarlet fever is seldom conveyed by inanimate objects, and the very rational conclusion, which has been preached in this country for a number of years, is that current rather than terminal disinfection is the efficient method. Sterilization of food utensils and the destruction of remaining portions of foods are advised.

The report can be especially recommended to health officers and those engaged in any way in the prevention of disease. M. P. RAVENEL

The Rise and Fall of Disease in Illinois—*By Isaac D. Rawlings, M.S., M.D., in collaboration with William A. Evans, M.D., D.P.H., Gottfried Koehler, M.D., and Baxter K. Richardson, A.B. Graphs developed and drawn by A. F. Dappert, and pictures of many persons associated with the story. Indexed by Clara Breen. Springfield, Ill.: Schnepp & Barnes,* 1927. 432 pp.

This volume has been issued in commemoration of the fiftieth anniversary of the founding of the State Department of Public Health of Illinois. It falls naturally into two parts, the first of

which treats of health conditions as far back as is permitted by the history of the state and the records. The second is devoted to conditions since the founding of the State Board of Health, and the establishment of correct records.

The introduction gives a brief, but interesting history of the territory itself. The history of men's struggles against the forces of nature is always interesting, especially when they are pioneers winning new lands for cultivation and settlement. This story has particular interest for the members of our Association, as John Henry Rauch was a member of the first Board of Health of Illinois, organized July 12, 1877, on which he served until 1891, his death occurring some three years later. He served first as secretary, then as president of the board, and as told in *A Half Century of Public Health*, was an unusually active man, not only in his health activities, but also in research. He was throughout his connection with the state board "easily the central figure of public health machinery and thought in the state."

Dr. Rauch was the fourth president of the American Public Health Association, his election having taken place in 1877.

The volume carries us through struggles of a midwestern state, much of which was in a district infested with malaria, and on account of its situation, subject to water-borne diseases. It is the story of a successful struggle of science against nature, directed by men with ideals as well as energy.

There are many biographies of the pioneer workers, all of whom played their part in the creation of health sentiment throughout the state, and in the establishment of a board of health which is recognized as one of the best in the country.

The book as a whole is really a history of preventive medicine, beginning about the time when bacteriology was coming to be such a potent factor in health work. It is well and interestingly written, abundantly illustrated, and well put together as a permanent record. It can be cordially commended to all who are interested in public health work.

M. P. RAVENEL

The Canadian Mothers Book, Mothers Series, No. 1.—*By Helen MacMurchey, M.D. Issued by the Department of Health, Ottawa, Can.* 163 pp. Obtainable upon request.

It would be difficult to find a better baby book than this little paper-covered *Blue Book* of 163 pages including the excellent index. It is up-to-date to the least detail and covers in a most pleasing manner the essential points in maternal and child care.

One point in particular is worthy of note and something it would always be well to remember in preparing books for mothers, that is: the reiteration of the father's share in the home. The appeal to sentiment of the right sort is well done but not overdone, and the positive note throughout, a great improvement on the old way of multiplying "don'ts" for parents.

In matters of diet a few items are interesting and a bit out of the ordinary. A salt-free diet the first week of every month after the fifth is advocated. Cod liver oil for pregnant mothers as well as for the baby is recommended.

Proper care of cows to produce the best milk for babies and the necessity of fresh air and sunlight for herds are duly emphasized.

Many things are mentioned which are most helpful to mothers and rarely covered, such as a list of "presents" for the new baby and knitting directions for various useful articles in the baby's wardrobe.

A standard weight chart is included with the book and the attractive photographs of "real" children add much to the general make-up.

MERRILL E. CHAMPION

The Teeth and the Mouth—*By LeRoy L. Hartman, D.D.S. New York: Appleton,* 1927. 93 pp. Price $1.50.

This little volume is essentially a primer for the mass of grown-ups for whom oral hygiene and the art of dentistry is either a jumble of half truths and superstition or an entirely closed book. In question and answer form the author treats some 116 queries which the layman might properly desire knowledge upon, in simple, easily understandable language. The subject is considered from the point of view of the infant (and its mother) up to 6 years of age, the school child period, and the period of adult life. The subject is surprisingly well covered in a non-technical way in these few pages, though still more emphasis on the importance of preventive dentistry (with a discussion of how preventive dentistry differs from palliative or curative dentistry) might have been expected.

The book would have been improved by a brief interesting statement emphasizing the present status of oral hygiene and pointing out that the chief hope for the future lies in early preventive dentistry. A short glossary of the few inevitable technical words would have been a valuable companion to the excellent index. PHILIP S. PLATT

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

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BARENBERG, L. H. Effect of Carbon Arc Irradiation on Infants. J.A.M.A., 90:7 (Feb. 18), 1928.

Dangerous Dieting—An ample and balanced diet is the plea of this paper inveighing against the alleged dangers of dieting. According to the bread bakers "normal appetites are the best determinators of the kind and amount of food required," a statement which we doubt.

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BRUNDAGE, D. K. Sickness Among Persons in Different Occupations of a Public Utility. Pub. Health Rep., 43:6 (Feb. 10), 1928.

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CULPIN, M. Incidence of the Minor Psychoses. Lancet, 1:5 (Feb. 4), 1928.

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from the filtered air. What this proves is not quite clear, but it is hoped that the terrifying evidence will not prove a deathblow to this useful household appliance.

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FRIEND, G. E. Some Cases of a Scarlatiniform Type. Lancet, 1:6 (Feb. 11), 1928.

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GOLDBERGER, J., and WHEELER, G. A. Experimental Black Tongue of Dogs and Its Relation to Pellagra. Pub. Health Rep., 43:4 (Jan. 27), 1928.

Measles Control—A rational plan of preventing infants from being exposed to measles infection is offered as an emergency program for any community facing a measles epidemic.

HOILES, B. S. Measles a Community Emergency. Pub. Health Nurse, 20:2 (Feb.), 1928.

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TOOMEY, J. A., and HAUVER, R. B. Intradermal Vaccination. Am. J. Dis. Child., 35:2 (Feb.), 1928.

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WIEHL, D. G. Infant Mortality in Cattaraugus County. Milbank Quarterly Bull., 4:1 (Jan.), 1928.

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KEY TO ABBREVIATIONS

Am. J. Dis. Child—American Journal of Diseases of Children, American Medical Association, 535 N. Dearborn St., Chicago.

Boston M. & S. J.—Boston Medical and Surgical Journal, 126 Massachusetts Ave., Boston.

J. A. M. A.—Journal of the American Medical Association, 535 N. Dearborn St., Chicago.

J. Infect. Dis.—Journal of Infectious Diseases, 637 South Wood St., Chicago.

Lancet—The Lancet, 423 Strand, London.

Med. Off.—The Medical Officer, 36-38 Whitefriars Street, London, E. C. 4.

Milbank Quarterly Bull.—Milbank Memorial Fund, 49 Wall Street, New York.

U. S. Nav. M. Bull.—United States Naval Medical Bulletin, Government Printing Office, Washington.

New York State J. Med.—New York State Journal of Medicine, 2 East 103 Street, New York.

Pub. Health Nurse—Public Health Nurse. The National Organization for Public Health Nursing, 370 Seventh Avenue, New York.

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HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

National Federation of Day Nurseries—A report of the conference of this organization held in May, 1927, is worthy of careful study by anyone interested in child welfare problems. The report itself has been carefully prepared and printed, and the contents give much valuable information regarding several important subjects, including habit training, health problems, and varying types of nurseries. The biennial report of the president is stimulating, and indicates a broad conception of the problem of day nurseries. Modest reference is made to the recent publication of a new dietary for use in nurseries. A careful study of this dietary suggests that it would be exceedingly useful by many groups concerned with child welfare clinics and nutrition classes. "Nowhere is the spirit of progress more evident than in the growing concern of society for the well-being of the children. . . . There is a larger recognition than ever before of the fact that the future of the State depends upon the child of today. We, of the Federated Day Nurseries, must lead in the solution of all such problems as come properly within our province."

New Orleans—Bound in light blue covers, and occupying 127 pages, the biennial report of the health board of the Parish of Orleans and City of New Orleans presents a comprehensive picture of the work during 1925 and 1926. The crude death rate for white persons was 14.53 and for colored persons, 29.06, and for all persons combined, 18.32, in 1926. During the year, 2 cases of bubonic plague were reported, both being Japanese seamen, sick at the time of arrival.

Immunization measures were inaugurated to prevent diphtheria and scarlet fever in orphan asylums and in child welfare clinics. Health department expenditures for the year 1926, according to a classified statement, amounted to $234,319, an increase of over $7,000 over the previous year. The population in 1926 is recorded as 433,000. One of the features of the report is a table showing the number of deaths; population, and death rates by years, beginning with 1787.

Mosquito Extermination Commission—The 15th annual report of the Atlantic County (N. J.) mosquito extermination commission reviews the work of the 1927 season and is illustrated with several excellent photographs. The problems and possibilities of a mosquito extermination program are set forth in a manner to interest both laymen and technical workers in the field. It is stated that the salt marshes of New Jersey cover approximately 200,000 acres and account for many millions of two species of salt marsh mosquitoes. Heavy mosquito breeding follows abnormal, high tides, when the water brought up is not all drained off on the low tide but remains in the holes and depressions or on the meadow surface. This commission is evidently carrying on an active and successful extermination campaign. The total footage of new ditches for the year was 578,225 feet, making a total footage to date of over 10 million feet.

National Dairy Council—Methods of health education employed by the council in various parts of the country are described in the last annual report. In its educational work, emphasis has long been given to health as the great objective. Optimism is a keynote in this record of progress during a 7-year period. On the basis of Department of Agri-

culture figures, it is calculated that the per capita consumption of milk and its products during 1926 were 24 per cent greater than in 1920. Seven per cent fewer cows gave 34.7 per cent more milk than in 1920.

The work of the council was first concentrated, to a large extent, in schools. As the organization of these activities has become perfected, the work has expanded to reach adult groups. The nutrition department functions through different types of health and welfare agencies, coöperation having been established, for example, with 35 health departments in 25 states. There were supplied material, projects and exhibits to emphasize the need of proper diet, and the observance of the health rules. It is gratifying also to note that the need of pasteurization has been emphasized.

Racine, Wis.—Racine's annual report of 50 mimeographed pages again illustrates how an attractive and enlightening report may be prepared at a reasonable cost. The report is bound in heavy paper covers with an attractive front cover. Blue prints show graphically the birth and general death rates and important specific death rates from 1916 to the present time; and also the results of the appraisal of city health activities. A table of contents and a health organization chart precede the main report. Another noteworthy feature is a tabular statement showing time distribution in nursing service by years, 1924-1927. One page is devoted to a classified budget statement for each year, 1924-1928.

This city of 71,300 people records a birth rate of 20.6, a death rate of 8.2, and an infant mortality rate of 50.4.

Under educational activities it is noted that 505 news stories were carried in two daily papers, while 51 lectures and public addresses were given, in addition to various magazine and other health articles. In coöperation with the tuberculosis association, there were prepared a pamphlet entitled "The Heart of the Business," dealing with physical examinations, and a booklet entitled "Tuberculosis—The Maker of Orphans" (for enclosure in the Christmas seal solicitation letters). The diphtheria booklet was revised, and a smallpox vaccination leaflet was prepared, entitled "When Great-Grandmother was a Little Girl." An active campaign to educate factory workers in health was launched during the year. This is an excellent report, carefully prepared, and well balanced as to statistical tables and descriptive text. It is a record of activity for a city of its size.

May Day—The Goal of May Day—A Year-round Program—is a little book published by the American Child Health Association, which gives a comprehensive child welfare program. Parents, teachers, pastors, social workers, all interested in children, will find suggestions of programs to promote the health and happiness of children in every walk of life. It is an attractive, well illustrated book, concisely and clearly written. The question and answer method is used in exposition with good effect. The importance of the school health program is stressed, with suggestions and illustrations, and the necessity of coöperation and coördination of home, school and community is brought out. Of considerable value are the bibliographies attached to various chapters, which should be stimulating to further study.

May Day, Child Health Day, is the title of the compilation of child health programs for 1927 throughout the country. To quote: "May Day was recognized and celebrated in every state in this country and in Hawaii." There were 50 May Day chairmen, and of these 36 were officials of the state boards of health. "May Day not only pours into the official health machinery of the country new currents of activity, but it serves

to interpret to a community dramatically and visually the work and aims of public health officials for the protection and encouragement of child life."

A list of the national groups coöperating includes state and government departments, lay groups such as Parent-Teacher Associations, League of Women Voters, American Federation of Labor, etc. Youth groups and, in fact, many important national organizations are listed. Abstracts in brief of the activities of these organizations, churches of various denominations, and lastly of the state programs are given. This is interesting as a record of what was done last year on May Day—also as a guide for what may be undertaken by these organizations and others this year to encourage child health.

Commonwealth Fund—The 9th annual report of the Commonwealth Fund describes the efforts to improve the physical and mental health of American children. An expenditure of $1,953,557 last year for this purpose and for hospitals, educational and welfare work is recorded.

A 5-year demonstration of health work in Fargo, N. D., was completed and the city has made provision for the continuance of every essential activity at its own expense. Fargo's health budget for 1928 calls for an expenditure of $1.13 per capita for health purposes as compared with $.28 in the year prior to the opening of the demonstration. The health work of the city is rated by the American Public Health Association at 814 points out of a possible 1,000 as compared with 320 the year before the demonstration. Similar demonstrations are being continued in Rutherford County, Tenn.; Athens (Clarke County), Ga.; Marion County, Ore.; and the official scoring of public health activities in these communities already shows gains comparable to that in Fargo.

In Austria where the Fund has aided in the support of various forms of child welfare and health work throughout the post-war period, no attempt has been made to import American public health methods, but standards of existing Austrian child health service have been raised and various extensions of the public health program have been made in accordance with the demands and understanding of each community. In the belief that the best way to improve standards is through the training of workers in strategic points throughout the country, scholarships totaling $39,000 have been given to physicians, midwives, and welfare workers.

The Fund's program for the development of child guidance clinics, visiting teacher work in the public schools, and allied projects in the field of mental hygiene is noteworthy. A 5-year period of demonstrations and consultant service under this program, ending in June, 1927, has resulted in the establishment of community clinics for the study and treatment of children's behavior problems in Cleveland, Philadelphia, St. Louis, St. Paul, Minneapolis, Dallas, Baltimore, Richmond, Milwaukee, Los Angeles, and Pasadena. Following a series of 3-year demonstration, together with advisory and consultant service, visiting teacher work has been organized in the public school systems of 58 communities located in 32 different states. School children to the number of 15,439 have been aided by visiting teachers in the solution of their difficulties in these demonstration centers and in New York City.

An outstanding feature of the Fund's mental hygiene program was the establishment this year of an Institute for Child Guidance in New York City. This Institute is fully equipped both for research and for practical work with children who exhibit conduct disorders and personality difficulties. It also provides a center for the special training of psychiatrists, psychologists, and psychiatric

social workers. Fellowships established by the Commonwealth Fund for students at the Institute are administered by the National Committee for Mental Hygiene, the New York School of Social Work, and the Smith College School for Social Work.

For the development of rural hospitals the Commonwealth Fund appropriated $414,000 during the year under review, making awards to Farmington, Me.; Beloit, Kan.; and Wauseon, O. Farmville, Va., and Glasgow, Ky., had received awards the previous year under this program, the objects of which are to provide modern hospital facilities in rural areas where they are needed, to assist in improving standards of local medical practice, and to provide an incentive for good physicians to remain in the country and for young physicians to go there. In accordance with a policy of coöperation which is applied so far as possible in all the Fund's local work, it is stipulated that the community shall pay a third of the cost of building and equipping the hospital and shall undertake its maintenance. The general plan includes the construction of 50-bed general hospitals in the selected areas, the development where advisable, of facilities for the training of nurses; provision for preventive and educational clinics as a part of out-patient service; fellowships to local physicians for post-graduate study; educational institutes and clinics for physicians; and the development of community public health activities in coöperation with the hospital.

Medical Education—The second report of the commission on medical education deals with the training and opinions of successful practitioners, the demands on medical practitioners, the opinions of state medical boards, and with medical school data. It is indicated that a large majority of physicians and educators who are familiar with the problem of medical education in the United States and Canada are evidently of the opinion that the general features of present medical training compare favorably with those in other fields of education and that great improvement has occurred in recent years.

It is stated that the regulations which have probably been most important in the improvement of medical education and which are large factors in the present rigidity and overcrowding are the requirements of each state for medical licensure. The primary function of licensure is to determine the fitness of the individual to practice medicine. The chief factors determining that fitness are the character, industry, and ability of those who study medicine and the character of the medical training. Twelve states now require an internship for licensure to practice and some medical schools require the internship for the degree of Doctor of Medicine.

In regard to the medical course, it is stated that "extensive lecturing and operative clinics for large groups are criticised by some, although their use has been greatly reduced. It is the current belief that time can be more profitably spent in reading or in elective work and that lectures should be confined to the general exposition of the principles of given subjects and to suggestive correlation of the various fields of study rather than to the presentation of subject matter." It is further stated that the selection of the teaching personnel of medical schools is considered by some to be as important as the selection of students. The vital influence of stimulating teachers who are masters in their individual fields can hardly be overestimated.

NEWS FROM THE FIELD

NEW TEXAS SEWAGE SECTION FORMED

AT the January, 1928, meeting of the Texas Section, Southwest Water Works Association in Houston it was voted to form a sewage division within the association for the purpose of advancing sewage research, and then admit a broader discussion of sewage treatment problems as they affect this state.

W. S. Mahlie, in charge of the Fort Worth Water and Sewage Purification Plants, was appointed director of this sewage division. Membership in this section entitles the member to a copy of National Sewage Research publication which is to contain papers of national importance along the various lines of sewage treatment. This publication is to be issued four times a year. Membership dues for the section are $1.00 per year and can be mailed to Mr. Mahlie at Fort Worth.

The first issue of the national publication is to be off the press July 1 and it is, therefore, desired that all those who wish to take membership in the section make their remittances to Mr. Mahlie promptly in order that he may send the list of members to the national office so that they may receive the first copy of the publication.

BUDAPEST CONFERENCE

EMERY R. Hayhurst, M.D., Fellow A.P.H.A., Ohio State University, Columbus, O., and Fred H. Albee, New York, N. Y., have been appointed Joint Chairmen of the National Committee for the United States to the Fifth International Medical Congress of Industrial Accidents and Occupational Diseases to be held in Budapest, Hungary, September 2-8, 1928. Richard Kovacs, M.D., New York, N. Y. has been appointed Secretary of the United States committee. Dr. Hayhurst, secretary of the Industrial Hygiene Section of the A.P.H.A. will present a paper at the Budapest meeting.

PURE FOOD CONFERENCE

CHIEF food inspector S. T. Pyper, of the Cincinnati Board of Health, has been elected chairman of the Cincinnati Pure Food Conference. The conference is an organization meeting of a group that is expected to be influential in enforcing the pure food and drug acts in Ohio, Indiana and Kentucky. The conference will meet quarterly.

HOSPITAL WILL CLOSE

THE trustees of the New York Infirmary for Women and Children, 321 E. 15th St., New York, N. Y., founded in 1853 by Dr. Elizabeth Blackwell, have voted to close the institution on July 1. The reason given is that the mounting deficit of the institution is too heavy to carry. No announcement has been made as to the future disposition of the hospital's assets. The last report of the United Hospital Fund (1926) put the assets at $1,354,697, about equally divided between property and investments. The income that year amounted to $170,044 of which $95,643 was earned and the total expenditures of $196,847.

MALARIA INCREASES IN NEW MEXICO

DURING the past year there has been a marked increase in the number of malaria cases in Doña Ana County, N. M. Dr. C. W. Gerber, county health officer, prepared a report covering the situation and made definite recommendations to the county commissioners regarding the control measures to be taken. The county was unable to

finance any work this spring so the commissioners appealed to the State Board of Public Welfare for aid. As a result of this appeal, the Board of Public Welfare has borrowed $2,500 on the credit of the state to be advanced to Doña Ana County. This money is to be used to finance necessary control measures until July 1, when the county will be able to make a levy to do the work itself. Measures to be taken include planting of top-minnows, dusting with Paris green and quinine administration.

NEW YORK STATE CANCER LABORATORY TO RECEIVE LEGACY

THE New York State Institute for the Study of Malignant Diseases is one of three organizations which will benefit by a trust fund of $100,000 left by C. P. H. Shoellkopf of Buffalo, N. Y.

RESEARCH ON SLEEPING SICKNESS

AMONG the awards made by the John Simon Guggenheim Memorial Foundation to American scholars, scientists and artists is the fellowship granted to Dr. Warren K. Stratman-Thomas, research pharmacologist of the University of Wisconsin, for research for a satisfactory drug for treatment of sleeping sickness. Dr. Stratman-Thomas who will work with Dr. Clement C. Chesterman in the Belgian Congo, will endeavor to determine by clinical trial the therapeutic value of 6 new arsenical compounds in the chemotherapy of animal and human sleeping sickness.

PUBLIC HEALTH DISCUSSED BY MEDICAL GROUP

AT the annual meeting of the Medical Society of New York State to be held at the State Armory, Albany, N. Y., May 21-24, a section on public health has been arranged. The following program will be given:

May 22—The Source of Brucella Abortus Infection in Man, Charles M. Carpenter, M.D., Ithaca; Social Hygiene in Mississippi Flood Relief, Albert Read, M.D., Albany; Whooping Cough, Edward S. Godfrey, Jr., M.D., Albany; Public Health Work by County Medical Societies, Guy Turrell, M.D., Smithtown Branch.

May 23—Corrections of Physical Defects in School Children in Small School Systems, David C. McKenzie, M.D., Granville; 1928 Medical Legislation, Paul B. Brooks, M.D., Albany; Methods in Obtaining Milk Code Adoption, Hilton J. Shelley, M.D., Middletown; Laboratory Control of Milk Under New State Code, Morris Maslon, M.D., Glens Falls; Control of Impetigo Contagiosa, Ellis Kellert, M.D., Schenectady.

Dr. Leo F. Schiff, health officer of Plattsburg, is chairman of the section and Dr. William L. Munson, district state health officer, is secretary.

PASADENA'S HEALTH TOURNAMENT

A tournament of Health Week in Pasadena, Calif., April 29-May 5, has been announced by Dr. Warren F. Fox, city health officer. Special days are given over to safety first, child hygiene, hygiene, hospitals, and health education. The program will be concluded by a health parade.

MEDICAL JOURNAL CHANGES NAME

WITH the February, 1928, issue, the *Boston Medical & Surgical Journal* appeared as *The New England Journal of Medicine*. In commenting editorially upon the change of name of the journal, which had its origin in 1828, when the *New England Journal of Medicine and Surgery* and the *Boston Medical Intelligencer* amalgamated, the statement is made: "The times have changed and the sphere of usefulness of the Journal has widened and today the same Journal, under a new name opens its one hundred and ninety-eighth volume."

SAFEGUARD HEALTH IN BUILDING INDUSTRY

IN its program for the future the new aim of the American Institute of Architects will foster country-wide health and safety in the building indus-

try, according to a statement made recently by D. Everett Waid, past president of the institute and a member of the committee. Committees are coöperating with the Building Trades, Employers' Association, the Workers' Health Bureau and other organizations to safeguard life and overcome the great economic waste.

BETTER HEALTH SPECIAL

THE Missouri Pacific "Better Health Special" which for 28 days in January and February toured the state of Texas promoting health education in the 110 towns visited, proved to be an effective means of disseminating health facts. It is estimated that approximately 70,000 persons saw the exhibits and heard the lectures. The Health Special personnel included representatives of the U. S. Public Health Service, the U. S. Department of Agriculture, the State Departments of Health of Texas and Louisiana, and also railway surgeons, sanitarians and city health officers. The train was provided through the generosity of L. W. Baldwin, President, and H. R. Safford, vice-president of the Missouri Pacific Railroad.

NUTRITION BASIS OF MEMBERSHIP DRIVE OF SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

AS an opening drive for membership, the Southern California Public Health Association was fortunate in securing the services of Dr. W. D. Sansum, author and noted expert on foods and metabolism. Dr. Sansum is the author of *The Normal Diet* and the head of the Potter Metabolic Clinic at Santa Barbara. As a contribution to the advancement of public health in Southern California, he is giving a series of four lectures, the first of which was delivered February 24 on "Acidosis in Relation to Errors in Diet." The association has an associate membership of nearly one hundred.

Owing to the fact that Los Angeles County produces annually about $90,000,000 worth of food products, and nutrition has such a close relationship to public health, the association believes much greater attention should be given this subject than has been the practice in the past. It hopes to develop a close relationship between the large corporations engaged in handling food stuffs and the Southern California Public Health Association.

A committee, of which Dr. Warren F. Fox, Health Officer of Pasadena, is chairman, has been engaged in making a study relative to the subject of milk in relation to the spread of communicable disease, and will soon present its report. Recent agitation throughout the country on the subject of whether all milk should be pasteurized has made this committee necessary.

Pasadena is now housed in her own Civic Center, costing well over $1,000,000 and the Health Officer is occupying a new suite of offices, which places Pasadena in the forefront with one of the best equipped departments in the United States.

Ground was broken for a new $75,000 County Health Center on February 14 in the City of Santa Monica, which city has affiliated with the County Health Department of Los Angeles County. Dr. William Reasner, formerly associated with the Health Department of Minneapolis has been appointed by Dr. J. L. Pomeroy as Health Officer of the Santa Monica District.

Great interest is being shown throughout Los Angeles County by the announcement that the American Public Health Association is soon to make a survey of the County Health Department under the Efficiency Bureau of Los Angeles County.

Dr. A. S. Baker, Southern California representative, announces that construction of a health center costing approximately $100,000 for Belvedere district

will soon be commenced. Dr. Baker is Deputy County Health Officer in charge of Belvedere District.

TRAINING PHYSICIANS IN PUBLIC HEALTH

A course of study to train physicians who are about to enter the field of public health is being given at Nashville, Tenn. This course, conducted under the auspices of the Tennessee State Department of Public Health, and the Department of Preventive Medicine of Vanderbilt University School of Medicine, is primarily for the purpose of changing the attitude of a medical practitioner to that of a health officer. In order to make administrative procedure easier, a faculty committee consisting of Drs. W. S. Leathers, E. L. Bishop, W. K. Sharp and Joseph W. Mountin was formed. Dr. Leathers has charge of the work at the university and the field work is being supervised by Dr. Mountin.

They plan to develop habits of systematic research and study, to review clinical subjects pertaining to public health, to demonstrate field methods and to assign the trainee to definite survey projects in order that his ingenuity and resources can be tested.

NEW HAVEN COUNTY PUBLIC HEALTH ASSOCIATION MEETS

THE regular meeting of the New Haven County Public Health Association was held in New Haven, Conn., March 1, 1928. Some of the papers read were:

"Smallpox: Differential Diagnosis and Other Items of Importance," by Dr. Millard Knowlton, Director, Bureau of Preventable Diseases, State Department of Health; "Some of the Important Findings in the Recent Health Survey in New Haven," by Prof. C-E. A. Winslow, Yale University, and "Public Health Problems of Villages and Rural Districts," by Willis N. Butrick, Health Officer of Milford and Orange, together with Dr. C. N. Denison, Health Officer of Cheshire; Dr. A. S. McQueen, Health Officer of Branford; Dr. S. P. Taylor, Health Officer of North Haven.

DELTA OMEGA LECTURE

THE Delta Omega Lecture on "The Present Status of School Ventilation" at Massachusetts Institute of Technology, Cambridge, Mass., on March 16, 1928, was given by Thomas J. Duffield, Executive Secretary of the New York Commission on Ventilation.

WAR ON SLEEPING SICKNESS

FOR the purpose of consulting with a number of celebrated European specialists who have made studies of sleeping sickness, Dr. Josephine B. Neal, Director of the Wm. J. Matheson Survey of Epidemic Encephalitis, sailed for Europe recently.

Some of the doctors she intends to visit are: Dr. A. J. Hall, Sheffield, England; Dr. J. R. Perdrau, London, England; Dr. Doerr and Dr. Schnabel, Basle, Switzerland and Dr. G. Levaditi at the Pasteur Institute in Paris.

The Medical Center, 17 East 42nd Street, New York, N. Y. hopes to begin a study of the disease, following Dr. Neal's return from Europe.

AMERICAN CITY TO HAVE HEALTH SECTION

BEGINNING with the April issue the *American City Magazine* is to have a section entitled, "The Month in Public Health." This new feature will consist of an original review of public health progress of particular interest to city officials and civic workers. This department will be conducted by James A. Tobey, Dr. P. H.

PERSONALS

HELEN CHASE, of Waterbury, Conn., has given $10,000 to the Waterbury Mental Hygiene Clinic to supplement the work now being done there.

TREAT B. JOHNSON, Ph.D. has been appointed as Sterling professor of chemistry at Yale University, according to an announcement by the President of Yale. Dr. Johnson has been a member of the Yale faculty since 1898, and is noted for his research on the chemistry of bacteria.

DR. ALVIN H. CRANZ has been appointed physician to the Connecticut State Prison at Wethersfield, to succeed Dr. Percy B. Battey, recently resigned.

DR. WILLIAM H. MEYER, formerly resident physician at the Williams Hospital, Lebanon, Ind., has been appointed acting assistant surgeon in the U. S. Public Health Service, assigned to duty at U. S. Marine Hospital Number 2, Boston, Mass.

DR. JAMES H. STYGALL, Indianapolis, Ind., was elected president of the Indiana State Medical Association, at the annual meeting of the association, held at Gary, February 15-16.

DR. ELMER C. SINGER was appointed a member of the board of health of Fort Wayne, Ind., to succeed Dr. Raymond J. Berghoff, who resigned.

DR. HENRY S. HOUGHTON, recently appointed dean of the State University of Iowa College of Medicine, assumed his duties at the University Medical School February 1.

DR. DANIEL C. STEELSMITH, Sibley, Ia., has been appointed deputy state health commissioner, to succeed Dr. James Wallace, who resigned. Dr. Thomas E. Powers has been appointed to succeed Dr. Steelsmith.

DR. FRANK B. MALLORY was appointed professor of pathology at the Medical School of Harvard University, on February 1, and Dr. Cornelius P. Rhoads was appointed as instructor in pathology.

DR. BRUNO S. HARWOOD has resigned from the city health department of New York City, after 24 years' service and Dr. William C. Buntin will take over his office temporarily. A testimonial dinner was given to Dr. Harwood on February 6.

DR. MARION A. BLANKENHORN and Dr. Roy W. Scott have been promoted from associate professors of medicine to professors at Western Reserve University School of Medicine, Columbus, O.

DR. FRANCIS E. FRONCZAK, has been reëlected by a unanimous vote, health officer of Buffalo, N. Y., where he has been connected with the health department for 17 years.

DR. CHARLES A. BENZ, superintendent of laboratories in Buffalo, N. Y. has been appointed director of the division of communicable diseases. He will, however, still have charge of the laboratories.

DR. E. J. JOHNSTON has been appointed city health officer of South Pasadena, Calif., to succeed Dr. John Robert Reid.

THE CALIFORNIA STATE BOARD OF PUBLIC HEALTH at its meeting on February 4, appointed the following consultants in epidemiology, animal industry, entomology, sanitary engineering, parasitology, bacteriology, pathology, and legal matters pertaining to the Board: Dr. Walter Brem, Dr. Ernest C. Dickson, Dr. C. M. Haring, Prof. W. B. Herms, Prof. C. G. Hyde, Prof. C. A. Kofoid, J. Macfarland, Dr. Karl E. Meyer and Dr. Wm. Ophuls.

DR. E. F. W. ALEXANDERSON, consulting engineer of the General Electric Company and Radio Corporation of America, was presented with the John Ericsson medal at the 40th anniversary banquet of the American Society of Swedish Engineers in New York, February 11. The award was given Dr. Alexanderson "for his outstanding contributions to the field of radio engineering." The medal, founded in honor of the great scientist and engineer, Captain John Ericsson, has been awarded but once before, in 1926, to Dr. Svante Arrhenius, former head of the Nobel Institute and the first man to advance the theory of ionization.

MARIE T. PHELAN of the Federal Children's Bureau who has been loaned to the Texas State Department of Health to assist with the Birth Registration Campaign has just returned to Austin from a field trip, which included Gregg, Dallas, Tarrant and McLellan counties.

DR. I. R. WHIPPER, colored woman physician of the Children's Bureau of Washington, D. C., has been sent to Texas at the request of Dr. J. C. Anderson, State Health Officer of Texas, to do some work with the midwives of the state. It is hoped that in this way the birth registration work and other state requirements will be greatly improved.

DR. A. J. CROWELL has been elected President of the North Carolina State Board of Health to succeed Dr. J. Howell Way.

DR. JAMES R. SCOTT, City Health Officer of Berkeley, Calif., and formerly County Health Officer of Bernalillo County, N. M., will return to New Mexico April 1 to resume his former duties as Bernalillo County Health Officer at Albuquerque.

DOROTHY R. ANDERSON, Chief, Division of Public Health Nursing, New Mexico Bureau of Public Health, is now giving a short course on Health Education at the New Mexico State Teachers' College, Silver City.

DR. REUBEN L. KAHN, serologist in the Michigan Department of Health, and a member of the Michigan Public Health Association, has been invited to demonstrate the Kahn test for syphilis before the Serological Conference sponsored by the League of Nations Health Section.

DR. JAMES R. SCOTT formerly with the City Health Department of Berkeley, Calif., has become associated with the County Health Department of Albuquerque, N. M.

DR. NATHAN SINAI, associate professor of public health, University of Michigan, has been granted a year's leave of absence to act as Assistant Director of Study with the Committee on the Cost of Medical Care. Dr. Niles Carpenter, head of the sociology department of the University of Buffalo has also been granted a year's leave of absence to accept a similar position with the committee.

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The Current Publications of the A.P.H.A.

A Half Century of Public Health. Edited by MAZYCK P. RAVENEL, M.D. 1921. Pp. 473. De Luxe ed., $10.00. Special Library Ed., $5.75.

A history of Public Health in the United States, containing nineteen chapters on every phase of Public Health by noted sanitarians.

Standard Methods for the Examination of Water and Sewage. 6th ed. 1925. Pp. 119. $2.00.

Physical and Chemical Examination of Water and Sewage, Microscopical Examination of Water and Bacteriological Examination of Water.

Standard Methods of Milk Analysis. 5th ed. 1927. Pp. 55. 50c. French ed., 50c.

Bacteriological and Chemical Methods of Analysis compiled by the American Public Health Association and the Association of Official Agricultural Chemists.

Standard Methods for the Examination of Water and Sewage and **Standard Methods of Milk Analysis** in one volume, $2.25.

Community Health Organization. Edited by IRA V. HISCOCK. 1927. Pp. 122. $2.00.

Revised plans for Communities of 100,000 and 50,000, and a new plan for 30,000 population.

Appraisal Form for City Health Work. 2d ed. 1927. Pp. 67. 50c.

Standards for measuring City Health Department work, by Committee on Administrative Practice. *Special price for six or more copies.*

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